

Colors and Coloring

in China
Painting



Keramic Supply Co.

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Colors and Coloring *in China Painting*



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INTRODUCTORY

Keramic art is of extreme antiquity, examples having been found in the ruins of Nipper, a city that flourished 6,000 years ago. Most beautiful examples of enameled pottery have been found in the ruins of the palace of Ramesis II in Egypt, dating 3,300 years ago. In former times it was next to impossible for a person to obtain the necessary colors, much less the knowledge of using them. The art was practiced by a family and the secrets were handed down through many generations.

Keramic artists have, therefore, labored under many difficulties, and it is only in recent years that china painting has been robbed of its mysteries, although some of the older teachers even today will tell you that the colors cannot be mixed; that gold colors and iron colors are incompatible; that grounding colors are different from painting colors; that a steel palette knife is injurious to certain colors, and especially to gold; that the colors look entirely different after firing than before firing; that certain colors must be fired at certain temperatures, and others at different temperatures; that tube colors are different from powder colors, and cannot be used together and similar fallacies.

Now the real truth is, that years ago certain colors were made by one individual, and other colors by another, and as each color maker used different fluxes, each color required a certain firing different from the others, and likewise, as the fluxes were of a different nature, the colors were not entirely successful when mixed.

This, however, has all been changed. The Royal overglaze colors, for instance, are all prepared from the same base; they can be used for painting, tinting or grounding; they can be mixed, and all of them are fired properly at a moderate temperature, which is equivalent to 700 degrees centigrade. Little firing tests are provided, whereby one is placed in the kiln, and as soon as it melts down, which is observed through the peep hole, the firing is judged sufficient. So that today, china painting is reduced to an exact Art, and the colors are as easily used as water colors.

Colors and Coloring in China Painting



COLORS

Mineral Colors derive their name from the fact that only mineral substances enter into their composition, as organic matters would be destroyed by the heat necessary for vitrifying them.

The base of colors for painting on china is called flux and it consists of lead oxide, borate of soda and pure silicie acid. This mixture is melted in a clay crucible until the mass becomes a clear fluid. It is then poured on a marble slab to cool. When cold it looks like glass. It is crushed and powdered.

By adding a proportion of metallic oxides to the above flux, mixing and in some cases remelting and regrinding produces colors. For instance, three parts of flux and one part of red oxide of iron produces an iron red, violet of iron may be produced by means of crocus martis. Oxide of cobalt is used for producing rich dark blues, cobalt and zinc oxides produce light blues, chromium or copper oxides produce greens, yellow greens contain uranium and chromium oxides, yellows contain uranium, rubies are produced by means of gold oxide, pinks contain silver and gold, many of the greys are produced by means of silver and other metals.

Some dealers call their colors "mineral colors," others use the term "vitrifiable colors" or "overglaze colors." All these terms have the same meaning because all colors for china painting are mineral colors, all of them are vitrifiable because they have the property of melting and becoming vitreous when heated to a high temperature. And all of them are overglaze colors because they are only suitable to be used on china that has been glazed.

Underglaze Colors differ from overglaze colors from the fact that they are not vitrifiable, that is, they will not melt nor form a vitreous coating when heated. So colors of this nature must be painted on the china before it has been glazed. Before china has received its coating of glaze, the potter call it biscuit ware. The underglaze colors are painted on the biscuit, then the ware is dipped in the glaze and after drying it is fired. After firing the color becomes a part of the ware and is under the glaze, and the effect is softer and richer than can be obtained by the overglaze painting; but, on the other hand, there are only a few colors that can be used under the glaze, so that elaborate or beautifully colored paintings

are practically impossible under glaze, and, as a rule, the work is done only in monochrome, such as in blue, greys or browns.

Enamels Strictly speaking, all overglaze colors are enamel colors, but there are relief enamels that differ from the regular colors in having more body, that is to say, they will not melt readily to a fluid, but remain thick, so that after firing they will be raised or in relief on the china, therefore they are more properly called relief enamels.

Relief enamels are used for heightening the effects on painting, especially for producing prominent highlights, but they are also used for the decorative effect when placed in dots, lines or scrolls. Some relief enamels are made to melt at a very low temperature so that they can be used for decorating glass, others are made to fire at the same temperature as for the regular painting colors, while others are made to fire at a much higher temperature.

Soft White Enamel is made for relief work on glass and on wares having a soft glaze such as tile, belleek, etc. It will fire at a barely perceptible dull red heat, or 550 degrees centigrade.

Best White Enamel also known as relief white and sometimes miscalled Aufsetzweiss, is made to fire at 700 degrees centigrade, which is the same temperature for firing ordinary decorated china. This is the most satisfactory white enamel for china painters to use.

Aufsetzweiss is the German name for hard relief white, but as a rule it is entirely too hard to be used alone, therefore decorators always mix some dresden flux with it so that it will come out of the kiln with sufficient glaze. It is sometimes used for mixing with softer enamels to harden them.

Paste for Raised Gold is also a relief enamel. It is usually of a golden yellow color so that after the gold is applied, should any of the paste remain uncovered, it will not be noticeable.

Colored Relief Enamels are about the same as best white enamel excepting that they have been tinted. The most useful are turquoise enamel, light blue enamel, pink enamel, light green enamel, orange enamel and vermillion enamel. Turquoise enamel is largely used for making turquoise jewels. Little dots of the enamel are placed at regular intervals, and oftentimes around the turquoise is placed a row of tiny dots of paste which are afterwards covered with gold, thus making a gold setting for the turquoise jewel. Other color enamels are also used in the same manner.

The powder enamels are better than ready mixed paste enamels because they will keep indefinitely and never become fatty like the tube enamels. They are always clean and ready for immediate use by mixing with a little royal painting oil to form a paste. It is not necessary to grind the enamel, simply add enough oil to make it work easily. The dry powder should be placed on the palette, which must be absolutely clean, and the palette knife must also be clean. Then mix in the oil. The enamel should be thick enough so that it will stay in dots without spreading when placed on the china. Do not mix with the palette knife any longer than

necessary to make a smooth paste. For making dots or jewels use a red sable liner. The brush should be well filled with the enamel and the point touched to the china. With a little practice the dots can be quickly made of uniform size.

In flat enamel work, which means to cover a comparatively large surface with relief enamel, the enamel is mixed with sufficient royal painting oil to make it flow easily and to spread some. A square shader, No. 6 or No. 8, is convenient to use. It is well filled with the enamel and then spread heavily over the design on the china. Enough enamel is used so that it will spread to form a smooth surface. After firing it will be slightly raised.

For making lines it is customary to lay the enamel on the china with a No. 2 red sable liner by lightly drawing the brush along the china. The brush must not be held upright, but must almost be laid on the china. The enamel paint should be thinner than used for making jewels, but not as thin as for the flat enamel work.

Enamels adhere better if they are moderately fired, and when possible put them on for the last firing only, as repeated firings or too hard firing may cause them to scale or chip.

Matt Colors are another class of overglaze. They are semi-vitriifiable and when fired do not show any gloss, but are dull, yet having a beautiful sheen, and are much admired when used in connection with lusters for contrast. Oftentimes the handle of a stein or tankard is done in matt colors and sometimes an entire article is decorated in matt and the painting is outlined with delicate lines of gold. Gold applied over matt colors produces a beautiful bronzy effect if stippled on. Matt colors are also called matt wax, gouache or Royal Worcester colors.

Matt colors are more desirable in conventional designs than in naturalistic painting, and they are most frequently used by the dusting method. A matt ground should be absolutely uniform to look well, and it is easy to get a perfectly uniform ground by using royal grounding oil. It is a very black oil made especially for the purpose. It is to be painted on the china, then use a dabber made of dusting wool covered with two or three thicknesses of china silk. The oil surface is to be pounced until it becomes of an even grey tint. The more the surface is pounced, the lighter will become the grey tint and when the color is applied, the lighter will be the tinting. It is a common mistake for beginners to leave too much oil on the china. Ordinarily the oil surface should be pounced until the surface is a pale grey. The color is then dusted over the surface, using plenty of color. Dusting wool is used for distributing the color. Only a certain amount of color will stick to the oil, and all the rest must be carefully removed before firing.

Glass Colors are similar to the regular overglaze colors excepting that the base is softer and melts at a much lower temperature. This is necessary, as glass will not stand as hard firing as china. It would melt out of shape. Glass can be fired to a barely perceptible dull red as seen in the kiln when in a dark room. A dull red cannot be easily distinguished in daylight.

Any of the china colors can be used for painting on glass by softening

the color with special soft flux, which serves to make the colors melt at a lower temperature. Transparency is the main object sought, therefore the most transparent of the china colors should be selected for glass painting and sufficient special soft flux added to reduce them. From one-fourth to one-half flux is usually added. More flux increases the transparency, but weakens the color.

Glass should be fired at about 550 degrees centigrade. Firing tests are sold that will melt when the proper temperature is reached. They are called yellow No. 50 tests for glass. Glass can be fired in an ordinary kiln if care is taken to stop the firing just as soon as the colors have melted. An experienced firer can instantly tell when a color has melted because it looks wet. Until it has melted the ware looks dull, but as soon as the color melts it looks brighter and redder than the rest of the china or glass and also looks wet. This indicates that the color has melted and that the firing is sufficient.

Glazes are overglaze colors that are rich in glazing fluxes and are useful to secure uniform brilliancy to a painting. Some colors if applied thinly will not have sufficient body to glaze well, but a thin coating of glaze will make the entire surface glossy.

Royal Glaze is a colorless, transparent glaze and may be used over any color. In all cases, however, glazes should be applied thinly as a heavy coating of glaze is liable to cause the colors to fire out and thus spoil the painting. Certain colors, especially reds and browns, are very fugitive, and must be glazed over very thinly. Too much glaze over iron reds will cause the red to fire completely out, leaving a light greenish tint. This is due to chemical action and there is no remedy to prevent it.

Blues, greens, yellows and violets stand glazing best; pinks, greys and purples come next, then browns and finally reds, such as blood red, pompadour, carnation, etc.

Ivory Glaze This is the same as royal glaze, excepting that it has an ivory tint which serves to soften the effect in a painting, and is desirable to use with paintings containing considerable yellow, brown or green.

Lavender Glaze when used, gives a slightly reddish violet tone, and adds softness and richness to paintings containing blue or violet or purples. It also is used in conventional work for glazing over a design in copenhagen grey and white, giving a very fine tone.

DESCRIPTION OF COLORS

Ivory Yellow is a clear cream tint, very useful in delicate backgrounds, also for high lights in yellows and brown and for light yellow shades in miniatures and flower painting. It is used as a glazing color. It is often used alone or with gold bands for producing decorated china in ivory and gold.

Old Ivory is a delicate yellow of a dark cream tint, very rich. It gives a warm tone in backgrounds and harmonizes with light blue, yellows, pinks, or light greens. It may be used for shading ivory yellow, and it may be shaded with yellow ochre.

Trenton Ivory is a light yellow of a slightly lemon tint. It is used for the same purposes as the other ivory shades. It is shaded with canary yellow.

Lemon Yellow is a light yellow of rich lemon tone and is largely used in painting flowers, fruits and backgrounds. It is shaded with silver yellow, and for very deep shadows, with egg yellow.

Mixing Yellow is a standard yellow shade. It is a little darker than lemon yellow. It is much used in all kinds of china painting and gets its name from the fact that it is used largely in connection with other colors. When added to blues it causes a greenish cast. When added to greens it produces warm shades of green, etc.

Canary Yellow is a medium yellow shade, slightly darker than mixing yellow. It also may be used for mixing with greens, browns, and reds. It is shaded with egg yellow or yellow brown, and sometimes with brown green.

Silver Yellow is slightly darker than canary yellow and is used for the same purposes and in the same way.

Albert Yellow is darker than silver yellow. It is used in miniature painting and is a good strong yellow, very reliable and much used in flower painting and in backgrounds. It is shaded with yellow brown, and for deep shadows, with chestnut brown. ..

Egg Yellow is the darkest yellow. It has a pure rich tone, is a good buttercup color and for other dark yellow flowers. If applied very thinly will give an old ivory shade. Mixed with a little ruby purple will form an orange tint. Egg yellow is shaded with yellow brown, and sometimes with brown green.

Orange Yellow is a dark yellow of slightly orange tint and is used for dark yellow flowers and fruits. It is shaded with yellow brown and for the darker tones with meissen brown.

Yellow Ochre has a rich, deep, old ivory tone and is much used in figure painting in dark flesh tints for sallow tones. It is a useful highlight for dark browns and black. It is much used in backgrounds.

Yellow Brown is a light brown with decided yellow tint. It is a rich shade and is much used in backgrounds, also for shading yellows and for modifying greens. It harmonizes with light blue, light green, orange, reds and browns. It may be shaded into chestnut brown and then into dark brown for a graduated brown background.

Dark Yellow Brown is similar to yellow brown, excepting that it is deeper and a little richer in tone. It is used in the same way.

Brown Pink is slightly darker than dark yellow brown and has a decidedly pink cast. It is used in flower painting for shading the pinks, also for the foliage and background work.

Meissen Brown is a light brown of a rich coffee color. It is very useful in figure painting, also in backgrounds, and in paintings nuts, brown tones in foliage, flowers, etc. It is shaded with dark brown or shading brown. It harmonizes with yellows, greens, reds and browns.

Chestnut Brown is similar to meissen brown, excepting that it is a warmer shade of light brown and probably a little richer in tone. It is used for the same purposes and in the same manner as meissen brown.

Auburn Brown is a rich, medium brown, similar to meissen brown, but darker and richer. It is often called hair brown, and is much used in figure painting, also in flower painting, backgrounds, etc. It is sometimes used as a glaze for powdering dark browns. It may be shaded with shading brown.

Deep Red Brown is a brown red, and is used for the same purposes as violet of iron. The only difference is in the tone. It is a very rich, reddish brown.

Violet of Iron is a medium dark brown, but has a violet tinge. It is used in shading reds, also for painting rose stems, thorns, and brown touches in foliage. If applied very thinly it makes a pleasing tint for a background. It may be shaded with shading brown.

Dark Brown is a pure medium brown of dark tone. It can be used for shading any of the lighter browns and is much used in dark backgrounds.

Sepia Brown is a medium dark brown. It is darker than dark brown and much colder in tone. It is used for deep shading and for backgrounds.

Vandyke Brown is slightly darker than sepia brown and is used for the same purpose.

Shading Brown is similar to dark brown, excepting that it is darker in tone.

Chocolate Brown is about the same depth of color as shading brown, but it has a decided chocolate tint, slightly reddish tinge, darker and not so reddish as deep red brown.

Brown 4 or 17 is a shade similar to dark brown, but is darker and slightly colder in tone. It has a transparent effect and gives a fine underglaze finish when used in backgrounds.

Finishing Brown is sometimes called black brown. It is a very dark shade, and if heavily applied is almost black. It is used for very deep shading and for giving finishing touches and strengthening paintings for the last firing.

Black Brown is the darkest shade of brown and is very similar to finishing brown excepting that it is darker.

Pearl Grey is a shading grey for pure white flowers, white drapery, and also for very delicate backgrounds. It may also be used as a glaze for over light greens.

White Rose Grey is darker than pearl grey and more greenish in tone. It is the best grey for painting white roses and other white flowers having a pale green tint in the shadows. It may also be used for a glaze over greens.

Warm Grey is a beautiful soft grey of neutral tone and is sometimes called ashes of roses. It is very useful in flower painting and in miniature work makes a fine plain grey background.

Grey for Flowers is a standard grey used in flower painting. It is a clear medium shade and may be used in monochrome conventional work. It is the warm shadow tone in figure painting.

Silver Grey is very similar to grey for flowers excepting that it is colder in tone and is used as cool shadow in figure painting. It is fine in monochrome work and also is used as shading in flower painting.

Copenhagen Grey is a splendid shade, of bluish cast. It is very valuable as a background color in miniatures, as it harmonizes with almost any color. It is much used in conventional monochrome painting, such as the royal Copenhagen; also in naturalistic painting, especially for backgrounds, in greying blues and shading other greys.

Grey for Flesh is a dark grey which if applied heavily will fire almost black. It fires darker than it looks when mixed. It is used for the cold shadows in figure painting, also for deep shadows in any kind of painting.

Gold Grey has a peculiar reddish tinge and is the warmest shade in dark grey. It can be used in connection with browns, also in monochrome and conventional work.

Outlining Black is a good brilliant black, very useful for lining, lettering and for mixing with other colors to make them darker. It is also used in shading for very deep shadows. It can be intensified by adding a little ruby, and it can be lightened by adding yellow ochre. It is the best all-around black.

Purple Black is a good rich black with a very slight purple tinge. It is used for the same purposes as either the outlining or brunswick black.

Brunswick Black is a good intense black. It is used for the same purposes as outlining black, but will not fire quite as brilliant. On the other hand, it is a black that will stand considerable glazing. It is often recommended in figure painting.

Air Blue is the lightest shade of blue and is used for painting backgrounds, light blue flowers, draperies, etc.

Light Blue is also known as sky blue. It is darker than air blue, but is used for about the same purposes. It has a slight greenish cast.

Baby Blue is a clear light blue color. It may be used for shading air blue and can be shaded with cobalt blue.

Robins Egg Blue is similar to light blue, but is darker. It is used for painting light backgrounds, light blue flowers, etc. It may be deepened with deep blue green.

Turquoise Blue is a little darker than light blue and has a slightly greenish tint. It is a very transparent color and is very useful and desirable in light backgrounds, as it can be shaded into pink and it harmonizes with all other light colors. It is a good color for painting light blue forget-me-nots and other light blue flowers. It may be deepened with deep blue green.

Lavender Blue is much darker than air blue, but is very similar and may be used for shading air blue and painting flowers.

Violet Blue is darker than lavender blue and has a decided violet tint. It is a good color for conventional work.

Grey Blue is similar to lavender blue, but is darker and has a grey tint. It is a color giving a light underglaze blue and is useful in matching or imitating old blue decoration.

Cobalt Blue is a moderately bright blue of medium tone and is similar in shade to water color cobalt and is useful in conventional work as well as in flower and scenic painting.

Sevres Blue is a fine medium blue, bright in tone similar to new blue in water colors. It is used for painting bright blue flowers and for shading light blue. It may be deepened with banding blue.

Cornflower Blue is similar to Sevres blue, but is a darker and richer tone. It is used in painting blue flowers.

Azure Blue is a bright blue, darker than Sevres blue and richer in tone, but not as dark and rich as banding blue. It is used for the same purpose as banding blue.

Banding Blue is a dark bright blue, a pure rich shade same as Royal blue or Yale blue. This blue is not quite as easy to use as the other blues because it has a tendency to work mushy, especially in tinting. The remedy is to use plenty of oil and use the color rather heavily. It is finely ground, but the nature of the blue is different from the others in order to get its beautiful coloring.

Royal Shading Blue is darker than banding blue, and matches Aztec and the rich underglaze blues. If applied rather heavily to the china, then fired, then covered with banding blue and fired, it will give a very fine underglaze effect.

Delft Blue is a dark grey blue, one of the old-fashioned blues similar to old grey blue paintings. It must be applied moderately heavy to obtain deep coloring.

Copenhagen Blue is the darkest blue. It is also known as old blue. It has a decided grey cast and is very dark and if applied heavily will fire almost black. It is the blue for producing the blue grey tones so much admired in the royal copenhagen dark blue ware. The lighter blue grey tones of the copenhagen ware are produced with copenhagen grey. All the blues stand a heavy glazing with royal glaze and the darker shades of blue give fine underglaze effects if fired, then lightly glazed over with royal glaze. It usually takes three fires to get a good result, two paintings and one glazing.

Shell Pink is a light pink, and if applied thinly is very delicate. It harmonizes with light blue, apple green and old ivory and is used in delicate backgrounds, also for painting light pink flowers.

Peach Blossom is a light pink, slightly yellowish in tone. It is used in backgrounds and for the same purposes and in the same manner as shell pink. Peach blossom requires a moderately hard firing in order to develop the color, otherwise it is liable to come out brownish in tone. It should be fired to the full melting point of our No. 70 firing tests, but it will stand up to the No. 85 test easily.

Blond Flesh is a pink flesh tint. It is different from other makes of flesh tint, as it will not fire out and may always be depended upon.

Brunette Flesh is more of a sallow flesh tint than the blond flesh, but it is a good clear tint and can be made more sallow in tone by adding a very little yellow ochre. It is probably the best flesh tint ever produced, as it will not fire out and can always be depended upon.

Yellow Pink is a salmon tint, and if applied thinly makes a very fine flesh tint, as it will not fire out like ordinary flesh tints. It may be mixed with yellow ochre or yellow brown for obtaining a sallow or dark flesh tint. It is equally useful in flower painting and in backgrounds. It is also used as a glazing, giving beautiful soft pink effects when dusted over pink.

Best Pink is without doubt the best all-around pink. It does not require any special firing and always comes out a beautiful pink. It stands repeated firings and is a beautiful deep pink when mixed in the oil ready for painting. For tinting it should be made rather thin with the oil. It is used in all flower painting and in figure work, in flesh tints, it will not fire out like the ordinary flesh tints.

Rose is a color similar to best pink, and is the equivalent of German Rosa and other colors called rose. It is not so fine a color in the powder as best pink and requires more care in firing. It should be fired at the rose color heat, which is the equivalent to our No. 70 firing tests.

Crimson is a dark pink, same as burnt carmine in water colors. It is used for painting the dark pink American beauty roses, ruby purple being used for darkening and shading. It is sometimes used as glazing for over ruby purple or ruby.

American Beauty is a beautiful crimson shade, used in rose painting, giving pleasing rich effects.

Ruby Purple is a fine ruby red (sometimes called roman purple), used in painting red roses, draperies, and is used in backgrounds. It harmonizes with all colors, fires well and is easy to use, but should not be applied too heavily nor fired too hard.

Maroon is a rich deep ruby shade slightly different in tone and is used in painting deep red roses, also in painting rich red draperies.

Ruby is darker and stronger than ruby purple, and is used in painting the deepest Jacque roses. It may be deepened or shaded with black or finishing brown. Care should be taken not to apply ruby too heavily or to fire it too hard, as it is liable to fire bronzy or muddy. If applied right and fired lightly or at least not harder than indicated with a No. 70 test, it will come out a beautiful red color.

Lilac is a violet shade about the same strength as violet of gold, but much bluer in tone. It is a splendid color for violets, lilacs, light pansies, sweet peas, etc. It is used in backgrounds, also for representing distance in a painting and for painting indistinct flowers.

Lavender is similar to lilac, but is warmer in tone.

Violet of Gold is a delicate lavender shade, and a beautiful harmonizing color in light backgrounds and is much used for painting indistinct flowers, to represent distance in a painting, also for painting light lilaes, violets, etc.

Deep Violet of Gold is a color about midway in shade between violet of gold and ruby purple. It is a very reddish violet. It harmonizes well with ruby purple, lilac, violet and pansy purple. It may also be used with greens and browns.

Light Violet is a good violet of medium tone, useful in painting violet flowers, also for monochrome work.

Deep Violet is a rich true violet suitable for dark violets, pansies, sweet peas and other violet flowers. It harmonizes with ruby purple and also dark blue. It can be deepened and shaded with pansy purple.

Violet for Grapes is a rich tone made especially for painting grapes, but is suitable also for pansies or other flowers, or in draperies when a deep violet is required.

Pansy Purple is a rich, reddish, royal purple and a splendid pansy color, useful for deep purple sweet peas and other deep purple flowers. It is also used in draperies and backgrounds.

Orange Red is a bright orange shade, splendid for bright touches in backgrounds, especially when used with greens. Mixed with Russian green (deep chrome) it forms a fine bright chrome green. It is also used in painting nasturtiums and other bright orange flowers. It is a very fugitive color and liable to fire badly unless it is applied rather heavily. It can be applied very heavily to form an orange enamel if not fired too hard.

Nasturtium Red is a light red, slightly orange in tone, very useful in flower painting and backgrounds. It is the nearest orange shade in the reds. It gives the best orange tint when applied thinly. It fires well and is very satisfactory to use. It harmonizes with yellows, browns and greens; can be used in mixing with other colors; is shaded with blood red.

Yellow Red is similar to nasturtium red, and is used in figure and flower painting, in backgrounds, etc. It is a trifle darker than nasturtium and is also shaded with blood red or pompadour red.

Carnation is a little darker than yellow red and is used in the same manner. It may be shaded with blood red.

Capucine Red is similar to carnation, but is a trifle darker in tone and slightly different in shade. It is often used for all-over decoration, giving a splendid red glaze.

Blood Red is a good bright dark red, very much used in flower painting for bright touches and in backgrounds. It is also used in conventional monochrome work. It is also used in figure painting. It may be shaded with deep red brown.

Pompadour Red is a dark rich red, darker than blood red, and when applied very thinly produces a fine pink sometimes used in figure work for delicate flesh tints. It is often mixed with Albert yellow for making flesh tint, but the combination is not near as satisfactory as yellow pink. Pompadour red can be shaded with deep red brown or with chocolate brown.

Water Green is a pale green with bluish tint used for representing water in fish designs and in scenery. Also in delicate backgrounds.

Coalport Green is a fine light green of yellowish tone and is excellent for light green backgrounds, either alone or in combination with harmonizing colors such as yellows, browns, reds, pinks and greens. It can be deepened with yellow green.

Verdigris is a shade of green reminding one of the green oxidation on old copper, sometimes called copper rust. It is a good shade of green, very useful in conventional work, and it makes a delicate backgrounds of light green shade.

Apple Green is a splendid light green of cool tone and is used in backgrounds, harmonizing with light blue, pinks or yellow browns. It is used in flowers, fruits, foliage and in figure painting. It may be deepened and shaded with Russian green.

Yellow Green is similar to coalport green, but is somewhat darker in tone. It is used in backgrounds and in foliage for warm lights. It may be shaded with moss green.

Sap Green is about the same strength as yellow green, but is a clearer shade and not quite as yellowish in tone.

Banding Green is a bright light emerald green shade, very useful in conventional designs.

Moss Green is a medium green of warm tone and is very largely used in all flower painting, as it is a good medium foliage green. It also enters largely in backgrounds. It may be shaded with olive green or with any of the darker greens. It is known as moss green J. (Jaune) means yellowish.

Grass Green is a medium green of cold tone. It is largely used in backgrounds and in flower painting in foliage, etc. In the French colors it is known as moss green V. (Verte) means greenish.

Olive Green is a fine green, slightly warm in tone, and a little darker than moss or grass green and is rich in tone. It harmonizes with brown green, lighter greens and darker greens, and is largely used as a middle tone in foliage and backgrounds.

Rose Leaf Green is a peculiar grey shade of brown green and is very useful in foliage painting and backgrounds.

Grey Green is as its name indicates. It is of about the same intensity of color as olive green, but distinctly grey in tone. It is a beautiful color in monochrome work, especially in conventional work, and a design of this green on white china, afterwards glazed with green glaze, gives a very good double tone painting. This color is also used in naturalistic painting as a shading for lighter greens in backgrounds.

Brown Green is much used in foliage for the brownish tones in dried leaves, also as a shading color for other greens. It combines with browns or greens and is a very useful color.

Sepia Green is very similar to brown green, but is more like the water color sepia, and is used in foliage and backgrounds and can be used in place of brown green where a slightly warmer tone is required.

Light Blue Green is a turquoise green shade, but not as dark as turquoise. It is lighter than deep blue green and not as blue in tone.

Deep Blue Green is a fine blue shade, almost too pure a blue to be called green. It is similar to turquoise blue, but is much deeper in tone. A better name would be deep turquoise blue.

Emerald Green is a clear bright green and one of the purest shades of green.

Russian Green is a bright green, slightly bluish in tone. It is used in backgrounds and in monochrome work, also in general painting. It harmonizes with blues, violets, purples, browns or other greens. It can be shaded with dark green.

Turquoise Green is a fine green of distinctly bluish tone, but not near as blue as deep blue green. It is a true blue green shade, very valuable in figure painting, in draperies, backgrounds, etc., and is also much used in monochrome work and in naturalistic paintings. It can be shaded with night green.

Deep Chrome Green is a fine clear dark green similar to the deep chrome green in water colors and oil paints.

Dark Green is probably the purest shade in a dark green. It is a good strong green, slightly warm in tone, very useful in dark backgrounds, also in foliage for the dark shades, and is fine in monochrome painting.

Duck Green is a fine dark green, a little colder in tone than dark green and a little darker. It is used for the same purposes. It is the shade sometimes called delft green.

Myrtle Green is a very deep, dark green and very pure in tone, giving excellent rich coloring.

Night Green is a deep green with a slightly bluish tone. It is a fine color for shading cold greens and is very rich in backgrounds.

Shading Green is a very deep and rich green, pure and clear tone, and is used as a shading for other greens, also for dark green backgrounds, for handles, bases of large china articles, etc.

Dark Green No. 7 is a very dark shade. It is similar to duck green, but is darker and is used for deep shading, also in monochrome work. It is a very pure tone and is highly valued by many artists.

Black Green is the darkest green. It is similar in tone to grey green, but is so dark that when applied moderately heavy appears almost black, so that it is well named. It is used for the deepest shadows in other dark greens and for any purpose where a black green is indicated.

LUSTRES

Lustres are a form of overglaze colors. They come in small vials and are ready for use without mixing or diluting with any medium, but if for any reason you wish to dilute a lustre, the best medium to use is white lustre, but if the lustre is too thick and needs thinning then use essence or oil of lavender. Some oil of lavender, especially when fresh, contains a small quantity of water, and the least bit of dampness will cause the lustre to fire spotted, so it is safer to use essence, as it is less liable to be contaminated with water.

All lustres look almost alike in the vials, each one being a dark

colored liquid, and when painted on the china one color cannot be distinguished from another, and lustres fire much darker than one would judge from their thin, transparent appearance before firing.

Lustres will keep indefinitely if kept in well-stoppered bottles and in a dark, temperate place. Before using a lustre the bottle should be well shaken until all sediment is mixed in, otherwise the lustre is apt to fire pale and unsatisfactory.

It is most important that the brushes be perfectly clean and not used for any other purpose.

Failure more frequently occurs from improperly cleaned brushes than from any other cause.

It is advisable to have one brush for each lustre, otherwise wash the brush thoroughly after each lustre. First wash well in turpentine several times until fresh turpentine does not become discolored from the brush. Then dry the brush and wash it thoroughly in alcohol until clean alcohol does not become discolored, then again dry until the brush becomes fluffy.

Unless brushes are thoroughly washed as above described one cannot expect to have good results, as the slightest trace of one lustre may ruin another lustre.

The china or glass to be decorated must be perfectly clean and free from finger marks. After washing and drying the china in the usual way, wipe it with tissue paper and alcohol, and polish with clean, dry tissue paper, being very careful that there are no particles of lint remaining on the china.

It is essential to have the china and the lustre of the same temperature as the room, and this should be about 70 degrees, as lustres are apt to work irregularly if too cold or if too warm, and the best results are when the air is dry.

As a rule it is advisable to apply lustres thinly and as evenly as possible, and where a perfectly even coating is desired the lustre may be pounced with a silk dabber. If the lustre dries too rapidly a little oil of lavender may be added to it and the dabber may be dampened with oil of lavender. This will admit of large surfaces being pounced evenly.

If lustre is applied too thickly the normal brilliancy will become impaired and the lustre may fire dull and grey; if the lustre is too thick to be applied evenly, it should be thinned with essence. Two or three thin coats fired separately will be much more effective than one heavy coat. Each coating of lustre must be fired before applying the next coat and each additional firing increases the beauty of the lustre.

While applying and drying lustre decorations use the greatest care to avoid dust, as it will cause a spotted appearance after firing.

In covering large surfaces with lustre use a square shader of medium or large size, have the brush well filled with the liquid lustre and mop it over the surface as quickly as possible, having a silk covered dabber in readiness to pounce the lustre until it is even and almost dry, but take great care not to pounce the lustre after it becomes tacky, as that will cause it to fire with dark spots.

The various opal and mother-of-pearl lustres do not require pouncing; they are much more beautiful if applied unevenly; very striking effects may be produced by applying these lustres with a cork, usng

the cork as a stippler. If closely stippled it will produce a finely intermingled iridescence, and the coarser the stippling the more gorgeous will be the iridescence. Care must be taken not to apply the lustre too heavily, but with a few trials one can arrive at about the right application to obtain splendid results.

In firing lustres special care must be taken to have the work dry before placing it in the kiln; after the lustre has been air dried it is good practice to place the ware in an ordinary oven, leaving the oven door partly open and allow the ware to become hot; then let it cool very slowly. This will drive off some of the oils and other volatile substances and be less liable to smoke in the kiln.

The kiln must be perfectly sound and dry and the firing must proceed slowly at first, so that the oils may be driven off gently, and all fumes and smoke must be allowed to escape before the kiln gets too hot, as the smoke is injurious and may cause the lustre to fire dull and also to rub off easily after firing.

If the kiln is heated up too rapidly the lustre will rub off after firing.

Should lustres fire unsatisfactorily their tone may be changed, and often serious defects can be remedied by covering with mother-of-pearl and again firing.

But lustres that rub off after being fired should be entirely removed with erasing fluid; sometimes they can be removed by washing with bon ami or sapolio.

Lustres will stand several firings providing the kiln is sound and affords a ready exit for the gases that are formed in firing.

Oil kilns that have no provision in the muffle for a circulation of air during firing must be started with the door partly open until all the smoke is displaced in the muffle, then the door may be closed.

Gold, colors, enamels or raised paste can be used over fired lustres, and raised paste can be used over unfired lustre if necessary to save a firing. It is best not to use colors over lustres if it can be avoided, as there are eases when the results are highly unsatisfactory, and we do not recommend such procedure.

Gold can be used under a lustre or over a lustre. When under a lustre the effect is very beautiful in certain cases.

Blemishes in lustre decoration are sometimes covered by tracing fine lines or dots of Roman gold over the surface.

Lustres are best adapted for conventionalized designs. Raised gold work is very effective for outlining lustre designs, but there are cases when plain outlining black is preferable to gold. The black has the advantage of being less expensive and if neatly executed it is more attractive than gold work.

DESCRIPTION OF LUSTRES

White Lustre is used for increasing the brilliancy of white china. It gives a slightly iridescent effect, and when used on glass produces a silver-like splendor. White lustre is used for diluting other lustres to make lighter shades.

Ivory Lustre is a delicate tint and is mostly used as a lining for cups or other hollow ware, where a soft, delicate tint is desirable.

Old Ivory Lustre is a little darker and richer than ivory and is used for the same purposes. It looks well in connection with Roman gold; a very thin line of violet to separate the gold and old ivory produces a very pleasing color combination and is very attractive.

Yellow Lustre, when pounced, gives a delicate tint; two or three coats give considerable brilliancy and inclined to a grey tint. If applied over rose lustre a greenish tint is produced. Over steel blue an oxidized effect; applied over green gives a yellow green; over purple or violet the tone is slightly changed and adds to the iridescence.

Orange Lustre, if pounced, gives a warm light tint. If applied over ruby it gives a scarlet shade. Orange lustre is used as a covering for over rose, blue or green lustres. If orange is applied too heavily it is liable to fire mottled.

Light Shammy Lustre is darker than old ivory, giving a light ochre tint or a light yellow brown tint. It is used as a lining and in all-over decoration and in conventional work.

Yellow Brown Lustre applied thinly and pounced will give flesh tints suitable for poster or conventional work. It is a desirable all-over lustre and much used in conventional designs.

Dark Brown Lustre is a good dark brown shade. It is one of the newer shades and the best brown lustre tint yet produced.

Grey Lustre is about the tint of warm grey in colors. It looks well with gold work and in conventional designs with darker lustres.

Blue Grey Lustre applied thinly gives a pinkish tone or a lavender shade. Two or three coats give a greyish blue with a pinkish sheen.

Black Lustre gives a gun-metal or silver-grey tone with one or two coats. Several coats are necessary to give a strong black.

Light Green Opal Lustre is a beautiful pale apple green tint with iridescent reflections.

Ivory Opal Lustre is an iridescent lustre, giving silvery reflection and an ivory tint.

Pink Opal is an iridescent lustre giving pinkish reflections. If applied irregularly it gives brilliant reflections of light green, dark blue, ruby, yellow and rose tints.

Opal Lustre gives a variety of beautiful tints. By applying it thinly it will come out greyish, but with medium coats it will give yellow, brown, violet, green and pink reflections. If applied too

heavily it will give subdued grey tones. To get the best effects it is necessary to apply opal lustre unevenly. It is a beautiful lustre for linings and all-over lustre work. If applied over fired copper lustre it will give beautiful dark iridescent metallic mirror effects. The general tint of opal lustre is silvery white. The other opal lustres are similar in effect and should be applied about the same as opal lustre.

Mother of Pearl Lustre is similar to opal lustre. It has a silvery white tint and gives various colored reflections, but is not quite as strong or as beautiful as opal, but is very useful as a covering lustre for over nearly any of the lustres which should be fired first then the mother-of-pearl applied. It gives added iridescence to the other lustres. It is also used alone for linings and all-over tinting when less intense coloring is required than opal would produce.

Yellow Opal is a striking lustre with decided yellow tints, and if applied very irregularly will give silvery white, greenish, yellow and yellow-brown tints of great beauty and effectiveness and is especially fine for all-over work.

Turquoise Opal is a peculiar grey shade with turquoise green and blue tints, with golden, peacock blue and rose reflections.

Dark Green Opal gives various tints and reflections, the general tint being a dark green.

Light Green Lustre is a good lining lustre and if applied two or three times gives a fine yellow green tint. It is a good covering for any of the darker lustres.

Apple Green Lustre is a bright tint, usually requiring two coats for the best effects. If applied unevenly over fired liquid bright gold it will give a beautiful iridescent steel-green tint.

Blue Green Lustre is a clear tint, but if applied thinly gives a grey tone. Two or three coats give a good deep blue-green tint.

Olive Green Lustre is a good neutral tone of brown-green tint. If applied heavily will sometimes fire with a mottled effect.

Dark Green Lustre is useful as an all-over tint and if applied thinly may be used as a lining. Two or three coats give a very dark green. It is a fine covering lustre for over fired ruby, silver, purple or platinum, and if applied over liquid bright gold gives a fine bronze-green effect.

Air Blue Lustre is a pale blue shade of delicate tint.

Light Blue Lustre is a pale shade and if applied thinly is liable to fire pinkish. It harmonizes well with pink and light green lustres.

Turquoise Blue Lustre is the nearest approach to a true blue in lustres. It is a new production of good clear tint. Two coats give the best effect. If applied over fired liquid bright gold gives a fine steel-blue tint.

Steel Blue Lustre, if applied thinly, gives a grey tone about the shade of copenhagen grey. Several coats often give a deep blue shade with iridescent reflections.

Lilac Lustre is a soft shade of bluish tint if applied thinly, and a fine lilac shade when applied heavier.

Violet Lustre when applied with two or three coats gives a rich violet shade with ruby and gold reflections.

Purple Lustre is a rich shade with coppery reflections. If applied thinly gives reddish violet tints. It is beautiful when covered with light green lustre.

Best Pink Lustre is a true soft pink, giving a delicate tint when applied thinly and a stronger pink with two or three coats. It is the only reliable pink lustre.

Rose Lustre, if applied thinly, gives a pink tint sometimes bluish in tone. Two or three coats become decided bluish in tone with golden reflections. Covering with yellow or light green lustres gives additional coloring and iridescence.

Iridescent Rose Lustre, when applied thinly, gives pink and blue tints. Two or three coats give a blue-green shade, with ruby reflections. If covered with yellow, orange or light green lustres, gives additional coloring and iridescence.

Crimson Lustre is a shade between pink and ruby lustre. It is a clear and reliable color and a tint hitherto difficult to obtain.

Ruby Lustre gives a rich effect with two or three coats. If applied thinly gives a violet or gold tint. A good scarlet shade is produced by covering fired ruby lustre with orange lustre.

Silver Lustre and liquid bright silver are the same. If applied over a tinted ground it will come out with a frosted effect. When applied direct to the china it fires with a beautiful silver mirror and very rich effects may be produced by covering fired silver luster with dark green lustre, ruby lustre or violet lustre.

Platinum Lustre is the same as liquid bright platinum. It has a similar color to silver lustre and has the advantage of not tarnishing. It gives brilliant and beautiful effects when covered with other lustres.

Copper Lustre gives a dark gold color, very reddish in tone if applied thinly and very rich and coppery with two or three coats. Covering with mother-of-pearl lustre gives splendid iridescent effects.

Bronze Metal Lustre is a beautiful deep bronze color, with metallic reflections. If covered with apple green lustre, applied unevenly, will give beautiful iridescence.

Green Gold Lustre is the same as liquid bright green gold. It is similar to liquid bright gold excepting that it fires with green gold color.

Essence is used for thinning lustres that have become thickened from evaporation or long standing. Essence may be used for thinning liquid bright gold and also to soften ordinary Roman gold or unfluxed gold, and is especially useful when gold has become hardened and does not mix readily with turpentine. Some artists claim that Roman gold can be applied more smoothly and better if thinned with essence instead of turpentine.

GENERAL INSTRUCTIONS FOR PAINTING CHINA

Materials Required A set of at least ten colors, a bottle of painting oil, palette knife, a palette, a small bottle of ordinary turpentine, a bottle of alcohol, sketching ink and outlining pen, outlining brush, tracing and graphite papers, ebony tracing point, hard lead pencil for sketching, some clean china silk for making dabbers, a box of dusting wool and a few clean rags free from lint, or tissue paper for wiping off the china, drying the brushes, etc.

Colors A good set of colors, for a beginner would consist of mixing yellow, yellow brown, dark brown, outlining black, turquoise blue, best pink, pompadour red, moss green, brown green, shading green.

Brushes For flower painting we recommend the use of French camels hair brushes, the square shaders being used for bold strokes and the pointed shaders for detail work. Flat Russia sable brushes are used for backgrounds and tinting large surfaces, also for painting broad strokes.

For miniature painting and figure work nothing equals the round red sable and flat Russia sable brushes, and for very small work the camels hair pointed miniature brushes are used in sizes 000 to No. 1.

Flat Russia sable brushes are used for grounding and in laying flat colors in conventional work, and the French camels hair brushes are used for applying gold or lustres.

Care of Brushes Before using a new brush it is well to wash it in clean warm water to remove the gum that is often used for holding the hairs together. Quill brushes should be allowed to soak in warm soapsuds for half an hour or so to soften the quills so that they will not split when inserting the wooden handles.

After using a brush, wash it out in turpentine. Then it is a good plan to wash it out in warm soapsuds. Rinse thoroughly in clear water. Finally rinse well in alcohol and dry it before laying away.

A brush used for gold need not be washed out if you keep it in a corked glass vial while not in use. Long vials can be bought for this purpose.

Sketching the Design Most painters prefer to sketch the design free hand on the china. For this purpose a sketching pencil is used. It will write on the china without any preparation. Or pencil medium is used, a coating of which is given the china, and then any pencil may be used for sketching.

For those who do not desire to sketch the design free hand, the following method of tracing may be used.

A sheet of tracing paper is to be laid over the picture to be copied and the principal outlines are traced with a lead pencil so as to make a good outline drawing. Next fasten the two upper corners of the tracing to the china, using transparent adhesive tape, and arrange so that the design will be in the position wanted. Now slip a sheet of graphite paper (with the coated side next to the china) under the tracing and go over the design with an ebony tracing point. When all the outlines have been made, the graphite paper is removed, but the tracing paper is simply laid back out of the way until the lines on the china have been made permanent by going over them with sketching ink, which may be applied with a pointed brush or with an outlining pen, so as to make fine, clear lines. By leaving the tracing attached to the china, a comparison can be made between it and the ink lines so that corrections may be made if necessary.

The marks left by the graphite paper may be removed by wiping off with a little cotton. The ink lines are not easily removed, although they entirely disappear in firing. For miniatures and other fine work it is best to use Italian tracing paper and graphite transfer paper, which gives a delicate grey outline.

Preparing the Colors for Use Place a little of powder color on a clean white tile or palette, add a drop or two of royal painting oil and mix into the color, using a steel palette knife. For tinting, the color should be mixed with sufficient oil to make the paint thin enough so that it will flow freely from the brush. It is then painted on the china and while still wet may be gently pounced with a silk dabber so as to produce an even tint.

For Painting the paint should be of a creamy consistency, and not quite so thin as for tinting. When heaped on the palette it should be thick enough not to spread quickly. The paint can be applied as heavily as desired to secure deep rich effects, and it is possible to make a finished painting with one firing, but it is considered better not to paint too heavily and to finish the work in two or three firings. Each color must be mixed separately, and before mixing a new tint the palette knife must be wiped clean and a perfectly clean place must be provided on the palette, otherwise the colors may lose their purity of tone.

As an interesting test, we suggest that after you have mixed some dark color, to wipe off the palette and palette knife, then proceed to mix some white enamel or Dresden flux, and unless you have made your knife and palette perfectly clean, you will be surprised at the resulting color of your white. This test will emphasize the necessity of great care and cleanliness if you wish to secure the best effects in your painting.

It is equally as important that the brushes used should be carefully cleaned from one color before using in another one.

In painting, it is an advantage to have a palette with recesses so that the colors may be mixed and placed in the recesses, which prevents them running together as on a tile. If desired to mix the colors to produce a different tint, the mixing should be done after the colors have been prepared with oil. A much better effect is produced, however, not to mix the colors if it can be avoided, but instead to apply one color the first firing and the other color over for the second firing. This will prevent any muddiness and will keep the tones clear and pure. Very beautiful effects may be had in this manner.

Applying Colors to China Prepare the brushes for use by dipping them in the painting oil so as to wet them thoroughly, and then wipe out on a clean rag free from lint. The point of the brush is now dipped into the color so that only a little of the paint is taken up and is then laid where wanted on the china. For instance, in painting a rose, a little of the ruby purple is taken up with the brush and the design is painted in. The ruby purple forms the local tint. The shadows are made by darkening with royal violet or black, the white china is left for high lights, and the half tones are made by softening the edges of the local color. This is done by cleaning the brush with painting oil and wiping out the excess of oil. The brush is then used to partially remove the color wherever the half tone effect is desired.

Ground Laying by the Dusting Method An even coat of our black grounding oil must be applied to the china, and it should be pounced until perfectly smooth with a silk dabber. Use a Fitch stippler where you cannot get with a dabber. The more oil that is removed by pouncing, the lighter will be the tinting. The oil is a quick dryer, and the dusting may be proceeded with as soon as the oil is sufficiently pounced, which is determined by a perfectly even grey tinting on the china.

For light tinting, mix the grounding oil half and half with turpentine before applying it to the china, then pounce until it is a very light grey color.

Before applying the color it is very desirable that it should be freshly sifted through a silk sieve. This will remove all lumps and prevent all streaks or spots in the finished ground. Do not sprinkle the color on, but place it at one side of the china with a palette knife and distribute it evenly with a broad camels hair brush or a tuft of dusting wool, being careful to keep plenty of color under the wool. Continue the dusting until the oil will not take up any more color. This is determined by the absence of spots. The surface will have an even, dry appearance when properly dusted. The excess of color must be well dusted off the china.

If it is desired to produce a graduated background with several different shades of color, pounce the oil until tolerably dry, then begin with the lighter color which may be placed on the portion of the china wanted and gently spread to cover the space desired. Then shake the excess of color off the china and proceed with the next shade, which must be placed near the first color and dusted over into the first color, which will make the two shades blend into each other. The successive

colors may be dusted on in the same manner. Any irregularities in the first firing may be corrected by a second dusting, although with a little practice one may produce beautiful graduated grounds by this method with one firing. After dusting a ground, designs may be cut out of the tinted surface by scratching out with a dust needle or a flat-pointed stick.

Flushing Method The color is first applied to the china by the usual method of tinting, which consists in mixing sufficient oil with the color so that it will flow readily from the brush. It is then painted on the china, and while still wet is pounced with a silk dabber. The surface is then allowed a few hours to become dry. Dry powder color is now sifted and is dusted over the dry tinting. Always begin with the lightest shade and each color successively until the darkest. Dust the color with dusting wool or a camels hair brush. The most beautiful blended effects may be produced easily and perfectly by this method. At least two firings are required for rich effects. Delicate grounds may be produced with only one firing.

Powdering In certain paintings the treatment calls for powdering with a glaze or with some color. The object in powdering is to produce a soft effect which enhances the beauty of the painting. The method of applying the color is to first dry your painting in a warm oven, and when cooled use dusting wool and dust over the painting the dry powder color that is to be used. It is not necessary to use much pressure on the wool. If you are powdering just a portion of some painting, it is best to place your dry powder about in the center of the place to be powdered, then rub it around gently, spreading it carefully and near the edge of the place. Do not allow much color, thus causing the edges to blend away. Finally dust off all color that does not adhere to the painting. It is then ready to be fired. No. 12 or 13 camels hair grounding brushes are used for dusting dry color from the painted china.

Glazing To obtain a rich glaze the following method is used: Dry the painting thoroughly in a warm oven, and when cool, dust over with royal glaze. A very thin coating is sufficient. The excess of glaze should be carefully removed with a camels hair brush and the article fired. If the colors fire out too much it shows that the surface was too damp and too much glaze adhered. For the second painting the same plan may be followed. This method gives a beautiful under-glaze effect. Decorated china that has been fired may be glazed by giving the surface a thin wash of relief medium, allowing it to stand for about five minutes and should then be well patted with a clean silk dabber. Royal glaze is then dusted over. A medium firing is sufficient.

Painting Suggestions It is an advantage to work in a north light with the light coming on the work from the left. Warm tones are complimentary to cold tones and the effect of any color is improved by having its complimentary color near it.

Before beginning to paint, remember that wherever white is wanted the china must be left bare, and if light tints are wanted the color must

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be applied thinner, and if deep coloring is desired the paint must be applied heavily.

After painting, if the color fires out too light, it should be strengthened by washing over with some of the pure color. If the work in general is pale or dull it can be brightened by strengthening the shadows and half-tones, and finally washing in the local color. As a rule, shadows should be painted darker than they are to be when fired, as dark colors lose more in proportion than light colors in firing. When a color is too dark it may be corrected by washing over it a contrasting color. For instance, if the pupil of an eye has been made a deep black, it will look like a staring spot and spoil the effect of the painting, but a wash of yellow ochre or yellow brown over the spot will modify the intense blackness by lowering the tone.

In a like manner any color may be modified into other hues by painting over with the contrasting or harmonizing colors depending on the effect sought. Thus, a wash of yellow over dark green will make a yellow green; a wash of ruby over black will make a deep ruby. In fact, all colors are greatly deepened by washing them over black or dark grey. It is very difficult, however, to lighten colors. Oftentimes a wash of ivory yellow succeeds, but as a rule it is better to make adjacent colors or the background darker, then there will be more contrast between light and shade.

As a rule, backgrounds should be made to harmonize with the painting. For a poster effect it is necessary to paint the background with a color having strong contrast with the painting.

Coloring Suggestions The following suggestions may be applied in painting any subject. A flat tint is simply a plain color without variation. Flat tints are used in backgrounds and in conventional work. Any tinting consists of area, contour and tone. Tone does not mean color. It means the intensity or death of color. Each color has a scale of tones from light to dark. The simplest scale of color value is from white to black, and ordinarily consists of five tones as follows: White, light, medium, dark, black. The scale of color value applies to any color; thus you can have a very dark red, and by successively adding white you can obtain light red and pinks, until it finally passes into white. These differences in color value are the tones of the color. Color tones are often spoken of as shades, but strictly speaking a shade refers to a darkened color, while a tint refers to a color that has been lightened. The word tone covers any hue, shade or tint.

In painting any subject where form is to be shown, it will be found necessary to use tints and shades, because without these you will have a flat tint which will have contour and area, but will be devoid of the third dimension necessary for modeling and showing form. If you wish to paint a white object it will be necessary to use greys, or if you wish to paint a black object it will also be necessary to use greys. If you wish to paint a red object, it will be necessary to use tints and shades. The shades are most frequently made by adding grey to the red, so, practically speaking, every painting showing form must contain grey.

An easy illustration is to take a plain white card, cut off a corner of the card, place it on the card before you and with the light from the back try to represent the piece of card laying on a card in a painting.

You will observe that one edge of the piece of card is apparently whiter than the card, while the other edge is apparently darker, so if you attempt to paint the piece of card just plain white, it will be impossible to give it form, but it will be necessary to use a very pure white for the whitest edge, a very pale grey for the piece of card and a slightly darker grey for the dark edge.

The whitest edge is due to reflected light and is often known in painting as a high light. The darker edge is due to the shadow.

One can take any color of card and try the same experiment and in each case the result will be the same, proving that grey or a tint and shade of color is necessary to depict form.

The color of the reflected light from any colored surface will be influenced by the color of adjoining objects. It will consist of a mixture of whatever color of light falls upon the object with the color of the object itself. In a painting the reflected light will be shown lighter and brighter than the rest of the object.

For instance, a red apple hanging under green leaves will have a greenish light (reflected from the leaves) falling upon it, and light reflected from the apple will have a greyish tint, because red and green mixed produce grey. But if the same apple is out in the open and pure white light falls upon it, it will then reflect a pink tone, because white and red make pink. But if we place a yellow background beside the apple so that a yellowish light falls on it, then it will reflect an orange tint. And so on with any color.

It is customary to imagine a light falling on a painting from some one source, usually from the upper left hand corner. The position of the light is the very first thing to consider in any painting showing form, and after you have determined the position of your light, then paint all your highlights and shadows with reference to the one source of illumination.

In nature all shadows are cast in the same direction and all highlights are produced from the same source. Many otherwise good paintings are utterly ruined by the mistake of overlooking the source of illumination and of putting highlights and shadows in opposition.

Oftentimes a little reflected light is shown from the shadow side of an object, produced by a highlight reflecting into the shadow. As an example, imagine an apple hanging so that light falls upon it from above, and underneath the apple is a bunch of leaves, also receiving the same light. Now the light falling on the leaves may be diverted upwards and reflect on the underside of the apple, giving a reflected light in its shadow. Such a reflected light is usually shown in a painting by a narrow light line. It will make the object stand out, giving it solidity and a stereoscopic effect.

While highlights and reflected lights are somewhat similar, it is more accurate to say that a highlight is the effect of the principal light falling upon an object. The reflected light is the light thrown from one object to another. Unless reflected lights are shown in a painting it will be devoid of sufficient perspective. The painting will be without merit, being flat and without life and form.

It is equally as important to have shadows in their proper positions,

as they also give perspective and solidity to a painting. The shadow produced by the sun is usually a grey such as may be produced by the mixture of white and black, but shadows are greatly influenced by the color of any colored light that is reflected into the shadow. To illustrate this clearly, set a tall article (a vase will do) on a sheet of white paper and place it near a window so that it will cast a good shadow. Now get a sheet of orange-colored paper and one of black, instead of orange paper, red or other color will answer, then place the black paper at an angle so as to illuminate the shadow of the vase. The black paper will not affect the shadow much, but, while holding the black paper, pass the orange paper in front of the black paper and you will plainly see the orange tint reflected into the shadow.

In the summer time, on clear days, the sun often casts shadows that are a violet grey shade. And in some of the most expensive paintings this fact is often taken advantage of, the shadows being distinctly violet in tone. In china painting the proper shadow tone can be secured by mixing violet and grey for flesh.

Coloring for Subjects The following treatments indicate the proper china colors to use in painting various colored subjects.

White for the local tone give a thin wash of pearl grey or silver grey. Pearl grey is used for blue-white objects, while silver grey is used for greenish-white objects, such as white roses and similar white flowers. For white objects of a slightly yellowish tone, ivory yellow is used, but it is applied only in a thin wash. The shades are the same colors applied a trifle heavier and the deepest shadows are produced with grey for flowers. The highlights are shown by the white of the china. But if the painting is influenced by colored light falling upon it, such as green from adjacent foliage, then a slight tint of that color should be represented wherever it falls upon the subject. As a rule, such color reflections are represented by slight touches of color, rather than by washes.

Yellow The local tone may be any yellow most suitable for the subject. The shades will be made by adding warm grey, or grey for flowers. The deeper shadows are yellow ochre or yellow brown or a darker brown, depending upon the amount of depth required. The highlights are either the white of the china or a wash of ivory yellow.

Brown The local tone should be a shade of brown suitable for the subject. The brown can be greyed with grey for flesh and the shadows dark brown, shading brown or finishing brown, depending upon the local tone used. The highlights would be old ivory or yellow ochre.

Black The local tone will be black modified by the addition of yellow ochre for warm tones and violet for cold tones. The shadows will be ruby, which intensifies black. Highlights are usually represented with yellow ochre, but a grey, such as grey for flowers or copenhagen grey, is often used, and, in a few cases, violet is used.

Pink The local tone is any suitable pink. For light pinks, shell pink is used, and for medium pinks, best pink is the right shade. For dark pink or American beauty roses, crimson is used. The pinks can be greyed with grey for flowers, and may be deepened with deep violet of gold or ruby purple. The highlights are the white of the china or a thin wash of the local tone.

Red The local tone will be nasturtium red for a light red. Carnation Red is a medium shade and pompadour red is the darkest red. They can be greyed with gold grey and shaded with deep red brown. The highlights will be a thin wash of the red used for the local tone.

Ruby Red The local tone will be either ruby purple or ruby. These are the colors used for painting dark red roses. They can be greyed with gold grey and deepened with a finishing brown or black. The highlights are produced with a thin wash of the local tone.

Blue The local tone will be light blue, turquoise or sverns blue for light shades and azure or banding blue for darker shades. Shading and copenhagen blues are very dark. They can be greyed with grey for flesh. The light blues are shaded or deepened with the darker blues and the dark blues are deepened with black. The highlights are a thin wash of the local tone.

Green The local tone will be light, medium or dark green, according to the subject to be painted. The lighter greens are deepened with darker greens. Any of the greens can be greyed with brown green or with grey for flesh. The highlights are thin washes of the local tone.

Deepest shadows in dark greens are made with black green.

Shadow Undertones Some of the best workers wash in their drawing in monochrome for the first firing, using copenhagen grey or warm grey. The highlights are left clear and prominent and the shadows are worked in so that the painting looks like a photograph would. Just the design in grey and white, but all fine detail is left out. The principal object is to get all the main highlights and shadows in the first firing. Then the second firing consists in tinting or coloring the grey monochrome, the grey forming undertones and the shadows. Only the deepest shading has to be added in the second firing.

This method enables one to get freshness of coloring not easily obtained in the usual way, which consists of mixing greys or black with the colors for shading.

In nature the shadows are very transparent and any colored light thrown into a shadow shows very distinctly, but in china painting if we attempt to place a shadow color over other colors, it is likely to change the color considerably, because the china colors are not completely transparent. Thus a strong wash of grey for flesh over a yellow would be sufficient to cover the yellow entirely. So, often in shading colors, it is customary to use a darker color instead of a pure grey. In the case of the yellow a darker yellow will form a shadow for a lighter yellow, or the lighter yellow can be shaded by using grey very thinly, but even then it is likely to lose its purity of yellow tone.

Unless one is experienced it is best to paint light rather than too

dark, because it is easy to strengthen a color, but very difficult to lighten a color. The only way to apparently lighten a color is to place a darker color beside it. Contrast of light and dark is thus affected. Black placed beside a color will produce the greatest contrast, while grey placed beside a dull color will often brighten it.

Sometimes it suffices to place a wash of contrasting color over a color to lower its tone and produce a grey or weakening effect if the color is too bright, but in cases where the color is dull or weak it can be brightened by washing over it a color of the shade desired. White placed beside a color apparently brightens and strengthens the color. Black beside a color will apparently make it appear duller and weaker.

One china color may be readily changed into another shade by washing one color over another, but each color must be fired separately. Some of the most beautiful shades are produced in this manner. Shadows are usually painted a little darker than they are to be after fired, as they often lose some in firing.

Contrast and Harmony The greatest contrast is black and white. In colors, red contrasts with green, yellow contrasts with violet, and blue contrasts with orange. But light red and dark green offer greater contrasts than light red and light green would. And so with all other colors, a light color contrasts with a dark color. Light colors will harmonize, or dark colors will harmonize in tone values.

The three primary colors, red, blue and yellow, are most nearly represented in china paints in ruby purple, sevres blue and mixing yellow. Any two of the primary colors result in a secondary color. Thus, blue and yellow make green; red and yellow make orange, and red and blue make violet. The secondary colors can be mixed to form tertiary colors and so on. The law of contrast is based on the three primary colors, opposites being the contrast. Thus, a color containing two parts blue and one part red would be a blue violet, and the proper contrast would be the equivalent proportion of the opposite colors, which would be one part red and two parts yellow. This completes the color scheme, making the amounts of each color equal. The first color is 2 blue, 1 red. The contrast is 1 red, 2 yellow. If you add all together it makes 2 of each color. The red and 2 yellow is equivalent to a yellowish orange tint.

This rule holds in any contrast that you may want to effect. Say you have a green and it is a yellow green and you estimate that it contains about 3 parts of yellow and 1 part of blue; the contrasting color will contain 2 blue and 3 red. This will be a reddish violet.

In china paints a few contrasts are: Best pink and apple green; light blue and a thin wash of nasturtium red; banding blue and yellow red; violet and egg yellow; lilac and lemon yellow; coalport green and pansy purple.

White Contrasts with dark colors and harmonizes with light colors.

Yellow contrasts with dark colors, the greatest contrast being with dark violets, blue or green. Yellow harmonizes with light colors, especially those containing yellow or red, such as yellow ochre, yellow brown, orange, light red, etc.

- Reds** contrast with colors containing green, blue or black and harmonize with colors containing white, yellow or red.
- Blues** contrast with colors containing yellows or reds and harmonize with colors containing blue or black.
- Violet** and purple contrast with yellows, greens and white and harmonize with colors containing reds and blues.
- Orange** contrasts with dark colors containing blue or black and harmonizes with light colors containing yellow, brown or red.
- Green** contrasts with colors containing red and harmonizes with colors containing blue or yellow. Bluish greens are called cold greens and yellowish greens are called warm greens.
- Gold** contrasts with dark colors and harmonizes with light colors, the best harmony is white, the least harmony is yellow. The best contrast is pansy purple, shading green, shading blue, shading brown, black, or with colors of similar tones.
- Silver** harmonizes with light colors. The best contrast is blue.

Coloring for Backgrounds In naturalistic flower painting it is customary to paint the background in tones that harmonize with the flowers and foliage and touches of complimentary colors to add life to the painting.

In conventional work the same general rules hold good, but often the complimentary colors are used instead of harmonizing colors, the object being to obtain contrast in coloring. Conventional work in flowers often looks exceedingly well done in grey, using copenhagen grey for the motif in the background; the flowers done in lilac, shaded with grey for flesh; foliage done in silver grey, deepened and shaded with grey for flesh. A little copenhagen blue can be worked in the background at the bottom or top of the composition, being carefully blended into the copenhagen grey, and for the last firing ground the entire surface of the painting with a thin coat of grounding oil, pounce evenly and almost dry, then let it stand for an hour or so and dust with copenhagen grey and fire. The result will be an underglaze effect in greys, and if well executed will make an attractive and desirable painting.

The following suggestions indicate the colorings to use for various general subjects: Thus, white roses, white lilies or white flowers of any kind would all be treated in a similar manner as far as harmonizing background is concerned, so, in these suggestions we class the subjects to be treated as white, yellow, pink, red, blue or violet and green.

White The flowers being white, they are usually shown by pale greys, and a good harmonizing background would be ivory yellow and old ivory into which may be blended a little light blue, some coalport green and to represent distance some violet of gold applied thinly to give a pale lavender shade. In the lower part of the painting, if there is any foliage, it will be represented with yellowish greens shaded with

brown green, and a suitable background in this portion of the painting will be greens and brown green in light tones worked in more or less indistinctly. Moss green, yellow green, yellow brown and meissen brown are colors that can be used.

White also looks well with a background consisting of a plain grey, such as copenhagen grey or warm grey, or copenhagen grey can be used for the foundation mixed with a little gold grey to darken it, which will give a slightly brownish grey and a strongly contrasting effect. White chrysanthemums, under these conditions, show off with splendid effect. Other white flowers would be made to stand out prominently with the same treatment.

Yellow Backgrounds for light yellows will be similar to those used for white subjects. For darker yellows, such as egg yellow, and shades approaching orange, we would suggest a background consisting principally of copenhagen grey, which should be in a plain, flat tint and put on rather thinly so as to give a delicate bluish grey. This background alone will make yellows stand out strongly, but by washing in some best pink near the subject will change the grey to a pinkish tint and be less contrasty.

A cloudy effect can be obtained by using pink in portions of the background and alternate or mix in with some light blue; thus you will have bluish, violet, lavender and pinkish tones over the light copenhagen which would show through in a part of the background. The pinkish tones can be blended into a darker tone with brown pink and a little lilac over the brown pink will deepen the tone. Adjoining these pinkish greys, a little cool grey, such as pearl grey, worked over the copenhagen undertone, will prove very effective in adding life to the background.

In certain subjects of yellow where considerable foliage is shown, it is well to use copenhagen blue applied thinly so as to give a greyish blue tone rather than a pure blue tint. Moss green can be blended into the bluish grey tint, and from moss green into brown green and darkened with gold grey. This treatment gives a scale of coloring from a grey blue tint through green into a harmonizing brown shade. Violet of gold worked into backgrounds containing considerable yellow and yellowish green tones is effective by introducing the complimentary color, and adds greatly to the general color combination. A little touch of bright yellow in the background of a yellow subject, if applied as a reflection from some portion of the yellow subject, is often very effective.

Pink The flowers or subject will be pink in light or dark shades with highlights almost white, the best harmonizing color being ivory yellow or old ivory, which may be blended into yellowish brown and into yellow green. The foliage will contain green, usually very yellow in tone, shaded with moss green and a little brown green. A little egg yellow, tempered with yellow brown, can be added with advantage.

For the lighter tones in the background, usually at the upper portion of the composition, may be pale lilac tint made by blending a little violet of gold into the ivory tints and some indistinct foliage or flowers may be worked into same, being shown by greys partaking of the same color as the surroundings. In the darker portion of the background use

yellow browns, and it may be deepened or shaded into gold grey and some brown green to modify the tones, the heavier portions of the foliage being thus enveloped; or the foliage may be partially hidden in a distinctly greenish background.

To have the pink subject stand out prominently it should be surrounded by dark or contrasting colors. Thus a pink rose would show up strongly from a dark bluish green background. This could be gradually blended into a deep blue green and finally into a light blue. Or the deep bluish green (such as night green) may be blended into brown green, then into yellow brown, which may be powdered with best pink or crimson, giving a ruddy glow. If you want considerable effective coloring in the background you can start with night green, blend into deep blue green, then into light blue, then into apple green, then into yellow brown, then into old ivory. Of course the arrangement of this scheme of coloring will depend upon the composition and the shape of the china. All of the foregoing colors would have to be applied lightly, as a heavy background would not harmonize with pink as well as a lighter background, but the deeper the shade of night green near the pink subject, the stronger would be the contrast and the more the pink would stand out.

A plain background for pink is one that consists largely of ivory shades, or silver grey slightly deepened with copenhagen grey would make a fine plain background for pink. To get a color scheme, the silver grey could be blended into apple green, then into brown pink, and then into brown green and browns, or, instead of browns, dark greens could be used.

Red A good harmonizing background for reds, such as carnation, blood red, pompadour, etc., will be as follows: The lightest tones will be a thin wash of lemon yellow, which is blended into mixing yellow, egg yellow, yellow brown, violet of iron, dark brown. Or, you can start with a thin wash of lemon yellow; blend into a mixing yellow, then into a yellow brown, and finally powder with a little apple green over the yellows, which will give grey tones which can run into greens if green foliage is shown in the composition.

Contrasting backgrounds for reds may be light or dark. An example of a light background would be lemon yellow, slightly modified in places with a deeper tint of lemon, or with silver grey worked in. A dark background is one consisting of greens, which should start with coalport green and shade into apple green or yellow green; then into moss, olive and darker greens. Powdering some portion of a green background with copenhagen grey will change the tone and relieve the effect of too much green, or greens can be blended into copenhagen grey and thence into a pale greenish blue. Greyish blues can be blended into brown green, then into browns.

Blue or Violet The principal subject would be painted with turquoise blue, lilac, violet or pansy purple, but the following suggestions will refer to almost any shade of blue or violet. An example of a harmonizing background is to start in the lightest portion with a thin wash of copenhagen grey, shading into light blue, thence

into azure blue and shading blue or into violet or violet for grapes in tones similar to the principal colors used in painting the subject. A bluish background may be clouded by powdering a portion with best pink, which will give a beautiful warm tone.

Another scale of coloring, starting with a thin wash of copenhagen grey, is to graduate the copenhagen from a pale to a darker tone, then blend in a little lemon yellow, allowing some of the lemon tint to show almost pure, from thence into yellow brown (thin wash) upon which is a very thin dusting or powdering of deep violet of gold.

For a subject painted in light blues or violets, a plain ivory background with a little lemon yellow worked in and a little nasturtium red, just sufficient to give a faint orange tone, will bring out the subject strongly by color contrast. A little nasturtium red in any composition containing blue or violet will add life to the painting, but only a very little should be used, and it must be applied thinly to give an orange tint.

A background consisting largely of yellow tones may be modified by powdering with yellow brown and by using a little nasturtium. Such a background can be deepened with gold grey and also with brown green where necessary to blend into foliage.

In any of the backgrounds for blue or violet subjects, the use of violet of gold powdered over ivory or over thin copenhagen grey will give a fine soft effect and will also act as a basis into which almost any color scheme can be started. Rich deep backgrounds can be made by blending violet and pansy purple into violet of gold, or from copenhagen grey blend into violet of gold, then into violet and into shading blue, then into copenhagen blue or black. From blue it is easy to shade into dark greens.

Green It is customary to paint greens with considerable latitude in coloring, especially in flower painting, and as a rule the greens in a composition are secondary to the principal subject, but there are cases where green is the subject, for instance, hops. The highlights in hops will be silver grey, or pearl grey. This will be graduated into moss green for the local tone, and the deeper shadows will be dark and shading greens. The leaves will be similar in coloring, with yellow green in the lighter portion and highlights of silver grey. A light background for hops or similar green subject will be ivory yellow, shading into silver grey; thence into russian green, then into turquoise green. For a warmer tone background yellow brown or chestnut brown can be worked in, preferably over the greens so as to give warmth to the greens and greyish tones. A very little orange or a few reddish tones used somewhere in the background will add effectiveness.

A darker background will consist of copenhagen grey applied moderately heavy so as to give a solid color, and a clouded effect can be secured by powdering over the copenhagen with violet of gold for warm tones, or with turquoise blue for sky blue tones, and a touch of pink with the blue adds color harmony. For a greater variety of coloring, coalport green can be blended into the blue tint and the coalport can be shaded into moss green; thence into the subject. Shading and brown green may be used in the deeper portions of the background and subject.

In some cases greys go well with greens, thus green foliage may be shown with a strong light falling on it. The high lights will be almost as

neutral in tint as warm grey, in fact, that could be used and grey for flowers tinted with moss green could be used for the local tones. The background would be a mixture of silver grey and warm grey, while it and the foliage could be gradually blended into turquoise green and deepened with night green and brown green, and the subject and background should afterwards be powdered with silver grey, which will unite the greys and greens to make a harmonious grey-green coloring scheme.

Distinctly warm tones may be worked into backgrounds with green subjects, especially if the subject is a warm green, the tint would run from a coalport green into yellow green, then into yellow brown, then into brown green and finally into gold grey or dark brown. A touch of blood red will add effectiveness when applied in the browns.

GENERAL TREATMENT FOR FLOWERS, FRUITS, ETC.

In china painting it is well for a beginner to select easy subjects at first, such as forget-me-nots, pink wild roses, poppies and single violets. There are two methods of painting. One is to wash in the local color in a flat, even tint for the first firing, the general form being indicated, but no attention being paid to the shading or modeling.

The other method is to do all the modeling in grey tones, copenhagen grey, warm grey or brown green applied thinly being used, and no local color is applied until after the first firing. In the latter method one simply paints as nice a monochrome of the composition as possible having clear high lights, but the grey used must bear some relation to the coloring of the subject. For delicate tints, the greys must be used very thinly so that a thin wash of the local color in the second firing will supply the necessary coloring. The grey will show through enough to form the necessary shadows. If the grey has been applied a little too heavily, then the color must be applied a little heavier, which will counteract a too grey appearance.

In the first method, after the flat tints have been fired, the design is modeled with grey tones, more of the local color being used where necessary, and the subject is built up from the flat tint.

In both methods it is customary to draw the design in sketching ink first, then apply the colors.

In painting, the brush should be used with firmness and decision. Make each stroke count. Do not dabble in the color after it has been laid on the china. If you do not get it on the china right at first, it is best to wipe it off and try until you get it right. One requires practice in china painting, same as in any other art.

In tracing a design, use good tracing paper and a sharp-pointed lead pencil. Let the lines be thin and carefully drawn, and trace sufficient of the details in addition to all of the outlines so that the tracing will be of exact value. Time spent on good tracing is well spent. The Italian tracing paper is the best to use. One can trace the design on the roughened side of the paper and afterwards transfer the design di-

rect to the china by marking over the back of the design with an agate burnisher or an ebony tracer.

The white French tracing paper is much cheaper and is also very good, but it is best to use graphite paper in connection with it for transferring the design to the china, and many also use the graphite with the Italian paper, as it gives a better tracing than just transferring the pencil lines only.

White Flowers such as roses, daisies, snowballs, azalia, narcissus, chrysanthemums, magnolia, wild carrot, cherry blossoms, all receive similar treatment. The first thing is to get a good drawing in sketching ink on the china and begin by painting around the flowers. The white china will form the local tone, and the modeling is to be done with pearl grey and silver grey and in very deep shadows grey for flowers may be used. Silver grey is used near the centers and in the shadows. It will furnish the delicate greenish tint that most white flowers have in the shadow.

Yellow Flowers For sweetbrier, roses, goldenrod, primroses, sunflowers, pansies, dandelions, chrysanthemums, buttercups, jonquils, daffodils, use mixing yellow for the local color, deepen with egg yellow and in the deepest shadows yellow brown may be used. For light yellow flowers use lemon yellow; sometimes a very little deep red brown is used in yellow flowers in the deepest shadows, or a touch of the same color as a reflection from the background.

Yellow Red Tulips, nasturtiums, pinks, chrysanthemums, autumn leaves and flowers, variegated yellow and red, are painted by using ivory yellow and nasturtium red. Honeysuckle is painted with yellow pink.

Red Flowers Poppy, cactus, scarlet sage, holly berries, etc., are painted with carnation for highlights. Nasturtium red will give a bright orange tint, and blood red is suitable for the darker portions. To make reds more vivid, use olive green in close proximity. It intensifies the red by color contrast. Distant red flowers are painted with violet of iron. Bluish reds, such as red roses, are usually painted with ruby purple. A wash of pompadour red over ruby purple will often counteract the slightly bluish tint and make a better red, but care must be taken, not to apply the pompadour too heavily.

A very thin wash of pompadour red over best pink will also produce a very fine pink tone.

Blue Flowers Forget-me-nots, lobelia, myrtle, bluebells, are painted with turquoise blue and deep blue green. Corn flowers require cornflower blue. Buds of forget-me-nots have a pinkish tinge which can be painted with touches of best pink over the blue local tone. Corn flowers often require a reddish tinge which can be supplied by adding a little pansy purple to the blue.

For the center of forget-me-nots, silver yellow and a touch of nasturtium red is used. The green leaves for blue-flowers should be very yellow, yellow green being used and shaded with olive green and brown green.

Purple Flowers Violets, pansies, lilacs, sweet peas, clematis, anemone, passion flower, morning glory, thistle, clover, wistaria, are painted with violet of gold, violet, and pansy purple.

Crimson Flowers Roses, peonies, pinks, use crimson, which can be deepened with ruby purple.

Brown Acorns, chestnuts, mushrooms, use yellow ochre for the light tints, chestnut brown for darker tints and auburn and shading browns for the shading.

Conventional Flowers A conventional painting of a flower can be made in various ways, but the main conditions are that there shall be no lights or shading to give modeling or solidity to the composition. The work must be painted in flat tints or its equivalent. The flowers may be drawn in the exact form of the natural blossom, providing it does not contain too much detail. More often the exact form is not adhered to, but an idealized form is substituted.

It is not necessary to repeat or balance the parts to obtain conventional work. A simple design of a flower laid out in flat tints is recognized as one form of conventional painting.

Most conventional work consists in repeats of a simple flat design. The greatest essential in conventional work is to have an exact drawing and carefully outlined with clear lines.

A FEW TREATMENTS

Anemone The white blossoms are painted with pearl and copenhagen greys. The centers are egg yellow with touches of moss green and deep red brown. The pink blossoms are painted with rose and shaded with ruby purple, centers same as for the white blossoms. The red blossoms are painted with ruby purple for the first firing, and in the second firing retouched with pompadour red, a thin wash in the lighter portions and applied heavier for the shadows. Being careful not to overfire after painting with the pompadour, this combination will produce the finest cardinal to be obtained.

The leaves are painted with yellow green and moss green, a little brown green and dark green No. 7 being used for shading.

Acorns Draw in the design, then lay in flat tints for the first fire, using yellow ochre, leaving the white china for the highlights. In the second firing, paint with meissen brown and dark brown, and in the deepest shadows use chocolate brown. The foliage is painted in moss green, olive and brown greens. The background should contain yellow brown, chestnut brown and gold grey.

Apple Blossoms The flowers can be laid in with a flat tint of shell pink. Use grey for flowers thinly for the soft shadows. For variety a thin wash of yellow pink can be used on some of the petals and deepened with best pink at the tips. For blossoms in the distance paint with a wash of crimson.

In the foliage use yellow green, apple green, olive green and dark green. In painting stems use brown green and deep red brown. For the very deepest tones in the greens use black green.

For the second firing strengthen the pink tones with a wash of best pink, a touch of egg yellow or yellow brown and a touch of brown green is used in the centers of the blossoms, also a little ruby purple for the deepest pink shadows.

Apples Quite a variety of coloring is used in apples, depending upon the kind of apple, but usually the red and white variegated apple is the one that is painted. The drawing is washed in with silver yellow for the highlights and ruby purple for the reddish portions, allowing the colors to blend. The ruby purple can be painted over the yellow if desired to get the striped effect. The leaves are washed in with yellow green and grey green; the stems in grey green. The background may be washed in with copenhagen grey.

In the second fire strengthen the red stripes and reddish tones in the apples with carnation. Ivory yellow may be used for adding highlights, a little egg yellow for adding touches of yellow. The leaves are to be modeled with grey green and dark green and in the background use yellow brown, gold grey, grey green and shading green. The stems are to be strengthened with brown green and gold grey. Gold grey can be used for deep shadows in finishing.

Asters In some compositions white, pink and purple asters are shown. The white blossoms are painted with pearl grey and shaded with silver grey and grey for flowers. The pink blossoms are painted with a thin wash of best pink, and between the petals use yellow pink and crimson, leaving the petals rather light, excepting those in the distance, which may be painted in shell pink and yellow pink. The purple asters are to be painted in lilac for the flat tint. Some of the blossoms may be done in lilac; darker ones paint with violet, and purple asters in the background or distance are best painted in violet of gold deepened, as necessary, with pansy purple.

The foliage is usually painted in yellow green, moss green, dark green and brown green. The background may contain a wide variety of coloring, but in general old ivory and yellow browns form a good basis upon which colorings of pansy, violet and deep blue green may be added for the cold tones, and a slight wash of nasturtium red for the warm tones, only enough being used to warm the yellow brown in places.

Blackberries are painted with shading blue and pansy purple; the highest lights are violet of gold. Unripe berries are painted with ruby purple. Distant berries are lilac, royal violet and ruby purple. The white blossoms are painted with pearl grey, the highlights being wiped out, leaving the white china for the petals; the centers are brown pink and touches of auburn brown. The leaves admit of considerable diversion in coloring. Ivory yellow, yellow green, olive green and brown green are used. The shading is dark green and a little finishing brown. Sometimes pompadour red is used for the red tint in the leaves. The background may contain turquoise blue, copenhagen

grey, egg yellow, best pink and pompadour red applied thinly for pinkish tints.

Buttercups are painted with egg yellow. The shadows are yellow brown washed in broadly and modeled in dark green, brown green and shaded with black green. For a background copenhagen grey applied thinly; then for the second fire use some best pink and some violet of gold and brown pink would be suitable.

Birds The swallow tail kite is painted with pearl grey for the white feathers, wiping out all except the slight edges of the feathers. The wing and tail feathers are painted with grey for flesh for the first firing. The brownish tones are auburn brown and night green, and the shading is night green and violet. The beak is violet of gold and brown pink, the eyes brown pink, the pupil is grey for flesh, darkened with violet.

The Blue Mountain Lory head feathers are painted in violet of gold, shaded with royal violet. The eye is yellow pink, darkened with a very little nasturtium red; pupil is grey for flesh, deepened with violet. For the beak use egg yellow shaded with yellow brown and auburn brown. Back of neck and other green feathers use grass green lightened with canary yellow for the light spots and shaded with royal dark green. In the deepest shadows use finishing brown. The breast is nasturtium red applied thinly for the first fire and is re-touched with blood red applied thinly. The inside of the wing is painted with egg yellow, yellow brown, pompadour red very thin for the light red and blood red shaded with pompadour red for the darker reds. The greys tones in the feathers are made with grey for flesh tinged with grass green.

Vermilion Fly Catcher is painted with crimson for the red in the head and breast, and in the second fire re-touched with carnation. The brown feathers are grey for flesh and retouched with shading brown.

Red Cross Bills The local tone is yellow brown, the shadows grey for flesh and finishing brown. The crimson tones are crimson for the first fire and retouched with carnation.

Butterflies The coloring is usually very gorgeous and much latitude is allowable. The achilles is painted with lemon yellow, chestnut brown, and shaded with dark brown and violet. The blue wings are sevres blue shaded with banding blue and the deepest shadows are violet and black. The owl butterfly is painted with yellow brown and old ivory mixed with grey for flowers for the lighter portions. The shading is chestnut brown, shading brown and finishing brown.

The colorings for batwing butterflies are variable. One is painted with carnations, meissen brown and violet darkened with black; another is painted in ivory yellow darkened with coalport green, a little gold grey and the dark portions are violet and black. A third variety

is painted with apple green darkened with deep blue green and the dark portions violet, pansy purple and black. The fourth coloring is brown pink darkened with gold grey and touches of shading brown. The panel is water green and the dark part of the wing is pansy purple. The Javanese butterflies are painted with egg yellow, gold grey and shading brown.

Carnations For white carnations pearl grey is used, the shadows being silver grey. For pink carnations use best pink applied thinly for the light pinks and crimson for the darker pinks. Crimson and violet of gold are used for shading. For deep red carnations use ruby in the first firing, and in the last firing cover with a thin wash of pompadour red.

Cherries The colors for red cherries are lemon yellow, yellow red and blood red; for dark cherries, ruby and pansy purple in the deepest tones. For unripe cherries use yellow green and shade it into yellow red. The stems are apple green shaded with violet of iron. The woody stems are brown green, dark brown and copenhagen grey in the highlights.

Chrysanthemums White blossoms are painted with pearl grey, wiping out for the petals and shading with copenhagen grey. Pink blossoms are painted with best pink and shaded with crimson and a touch of egg yellow for the center. For violet blossoms the local tone is violet of gold shaded with violet and in the deepest shadows pansy purple. The centers are egg yellow and a touch of nasturtium red.

The leaves are moss green and grass green, shaded with dark green, brown green and touches of violet of iron.

For the background use copenhagen grey, egg yellow, coalport green, pearl grey; a little nasturtium red powdered over the yellow will give an orange tint and a slight powdering of best pink over the copenhagen grey will give pinkish greys. Powdering with best pink over the pink blossoms and with violet of gold over the violet flowers will add softness and assist in blending the flowers in the background.

Clover Pink clover is painted with a wash of best pink or crimson for darker blossoms. The markings are ruby purple and the shadows gold grey. Distant clover is made with copenhagen grey and violet of gold. White clover is painted with pearl grey and shaded with silver grey. In the last firing touches of white enamel may be used for the highlights. For the light colored leaves use yellow green, retouched with grass green, and touches of brown green. Darker leaves are made with olive green shaded with dark green and brown green. For indistinctness some of the leaves may be powdered with apple green.

Cornflowers White cornflowers may be painted with silver grey and shaded with copenhagen grey. Pink flowers are made with best pink and shaded with silver grey. Blue flowers are made with corn-flower blue and shaded with shading blue. The leaves and stems are moss green, brown green and shading green.

Crabapples are painted with lemon yellow, yellow brown and carnation. The centers near the stem are deepened with shading brown. The stems are moss green, shaded with shading brown. The woody stems are brown 4 or 17, shaded with shading brown and a little copenhagen grey for the highlights. The leaves are moss green, brown green and a little turquoise green applied thinly for highlights. The deeper tones are dark green and shaded with gold grey.

Crabapple Blossoms are painted with shell pink, wiping out for the highlights and shading with copenhagen grey. The centers are moss green and touches of egg yellow and carnation. The distant flowers are shell pink mixed with a little copenhagen grey and greater indistinctness can be produced by powdering with brown pink.

Currants are laid in with ruby purple for the first firing, being careful to wipe out for the high lights. In the second fire retouch with yellow red and pompadour red and touches of chestnut brown for the centers.

The leaves are yellow green, turquoise green, olive green and shaded with brown green and shading green.

Daffodils are painted with mixing yellow. The reddish or orange tints are made with nasturtium red or carnation. Warm grey may be used for shading, and egg yellow in the deepest shadows. The leaves are grey green, shading green and black green. The highlights in the leaves are yellow green.

Daisies The white of the china forms the local tint. The shadows are silver grey. The centers are albert yellow and yellow brown. The leaves and stems are grey green, deepened in the shadows with brown green. A background of copenhagen grey for the white blossoms is very effective, which may be blended into yellow green and moss green for the back of the foliage.

Dandelion Albert yellow is used for the blossom, yellow brown for the deeper shadows. The seed balls are painted with silver grey, the seeds being shown with grey for flowers. The leaves are yellow green, moss green and shading green. Touches of violet of iron are used in the stem and a little brown green. A little brown green and violet of iron in some of the leaves adds variety.

Easter Lilies The white china should be left for the highlights and a very little pearl grey worked in for the lighter portion and shading into silver grey. The darkest shadows are brown pink worked into the silver grey. The centers are grass green, egg yellow, nasturtium red and the shading is dark brown. The leaves and stems are grass green, dark green and dark green No. 7, and the deepest shadows pansy purple over the green. Powdering with pansy purple will give depth to the green portions.

Elk The foundation color is brown pink, which is darkened with gold grey. The deepest shadows are finishing brown. A little albert yellow is worked into the antlers and shaded with gold grey and violet.

Fire Bush The blossoms have the same treatment as geraniums and the leaves are the same as for roses.

Fleur de Lis The blossoms are painted with lilac, which may be shaded with violet for the bluish tints, and the pinkish petals are painted with crimson, which may be shaded with ruby purple. The yellow centers are mixing yellow with touches of meissen brown. Yellow green, grey green and brown green are used in the leaves.

Forget-Me-Nots For the light blossoms use light blue; for those of medium tone use turquoise blue, and for the darker ones use sevres blue. The centers are touches of egg yellow and carnation. The leaves are grass green, grey green and brown green. A thin wash of pompadour red is often used in the background.

Geraniums For the first firing lay in the brighter blossoms with best pink and the darker ones with brown pink, wiping out the highlights where necessary. In the second firing retouch with carnation, blood red and pompadour red.

The leaves are painted with yellow green, grass green, olive green and brown green. The reddish tints in the leaves are produced by blending in crimson, violet of gold, auburn brown and a little shading brown in the darkest portions.

To obtain softness in the flowers, they may be powdered with carnation, using it very sparingly. The darker flowers may be powdered with brown pink. In a warm-toned background the leaves can be powdered with brown pink and pompadour red, which may be blended into a background of lemon yellow, shaded into egg yellow, yellow brown, auburn brown and dark brown. A little apple green blended into the yellows will add to the painting.

Gold Fish The local tone for the fish is egg yellow. The darker tones are yellow brown, which is wiped out for the scales. The golden tone is produced by retouching with carnation and touches of blood red. The deepest shadows are pompadour red. Water is painted by washes of pearl gray and water green.

Gooseberries are painted with mixing yellow, moss green, olive green and meissen brown in the first painting to represent the local tones and highlights. The berries are made with thin washes of color so that they will have a transparent appearance. In the second firing add the detail, such as ribbing the berries and putting in the tiny spines. Indistinct leaves and berries are painted with warm grey, yellow green and a little violet of iron.

Grapes Dark grapes should be painted with pansy purple; red grapes with ruby purple and crimson and the lighter, indistinct tones with yellow pink and yellow brown. The leaves and background require moss green, olive green, russian green, copenhagen blue, egg yellow, apple green, brown green and crimson. Retouch dark grapes with violet for grapes and pansy purple; red grapes with crimson, ruby purple and a little pansy. The deepest shadows are shading brown. The leaves and backgrounds are to be retouched with the same colors used

at first and strengthen the shadows with shading brown and violet for grapes.

Holly The berries are painted with yellow red, shaded with blood red, darker berries are painted with ruby and retouched with blood red. The leaves are night green for the first fire, afterwards retouched with turquoise green, shaded with brown green for the lighter leaves, and night green shaded with dark green No. 7 for the darker leaves.

Hops are painted with moss green, grey green and dark green and shaded with brown green and shading green.

Jonquils are painted with mixing yellow and albert yellow, in the center nasturtium red and dark yellow brown for the darkest shadows. The leaves are yellow green, yellow brown, turquoise green and shading green.

Larkspur The white flowers are silver grey shaded with grey for flowers, touches of lemon yellow for the centers. Pink blossoms are painted with peach blossoms, shaded with yellow pink and warm grey, touches of lemon yellow and meissen brown in the centers. Violet blossoms are lilac shaded with violet for grapes, a little gold grey in the deepest shadows. The foliage is laid in yellow green, grey green, brown green and shading green.

Lilacs The blossoms are painted with lilac and shaded with violet of gold and violet. The yellow touches are mixing yellow and velvet brown. The leaves are moss green and shaded with grey green and brown green.

Marigolds are painted with mixing yellow and albert yellow and shaded with yellow brown mixed with violet of iron. The leaves are yellow green, grey green, brown green and night green.

Nasturtiums The blossoms are painted with egg yellow, yellow brown, nasturtium red, carnation, blood red and ruby. The yellow flowers are egg yellow. The orange-colored flowers are made with nasturtium red applied thinly. The red flowers are carnation, the darkest red ones being blood red. The deepest shadows are ruby. The leaves are moss green, grey green and dark green.

Pansies White blossoms are painted with pearl grey and lilac in the shadows. Yellow pansies are egg yellow for the local tone, shaded with lilac and violet. Purple pansies are painted with violet and pansy purple. The centers of the white blossoms have markings of pansy purple. The markings for the centers of yellow pansies may be ruby and pansy mixed. The dark pansies have white markings and dark markings of ruby. The foliage is yellow green, grass green and brown green.

Peacock is generally painted in a conventional manner. The head and neck are painted in shading blue to which a little ruby may be added, also a little black for the deepest shadows. The color of the body is usually done with shading blue, turquoise blue and a little rus-

sian green. The lower part of the body and tail runs into russian green, turquoise green and apple green. The russian green above mentioned is the same as chrome green, not blue like some of the russian greens. The spots in the tail feathers are shading blue, turquoise green and deep blue green.

Peonies require about the same treatment as chrysanthemums, the only difference being in the size of the petals.

Phlox For the white flowers use grey for flowers. The centers are pansy purple with a touch of mixing yellow. The pink blossoms are painted with crimson and shaded with ruby purple applied thinly. The violet blossoms are painted with lilac and shaded with violet. The centers are pansy, with a touch of yellow. The foliage is yellow green for the first fire, then retouch with moss green, grey green and brown green.

Pine Cones The cones are painted with meissen brown, violet of iron and dark brown. The deepest shadows are chocolate brown. The needles are painted with dark green, brown green, grass green and a little black green for the deepest shadows.

Pink Roses The local tone is best pink applied thinly. For the darker portions use best pink a trifle heavier and crimson with warm grey for the shadows. Dark pink roses have a local tone of crimson which can be deepened with ruby purple. To obtain a soft, indistinct effect allow the painting to dry, and before firing powder with shell pink.

Plums are painted with lilac for the first fire and retouched with violet for grapes and pansy purple. The leaves are yellow green, moss green, brown green; the stems are shaded with brown green and violet of iron.

Pond Lilies are painted with silver grey and pearl grey for the white petals. The outer petals are yellow green, which may be toned with grey green and brown green. The centers are silver yellow with yellow brown and touches of nasturtium red for the stamens. Water is painted with water green shaded with deep blue green. The deepest shadows are night green. The leaves and buds are yellow green, grey green and brown green.

Poppies White poppies are made with a thin wash of pearl grey shaded with silver grey, and for the darker shadows use silver grey and grey for flowers. The centers are the same as for red poppies. Pink poppies have best pink for the local tone. They are retouched with crimson, ruby purple, and in the very deepest shadows, pansy purple. When yellow is used in the background a touch of lemon yellow in the highlights is often very effective.

Red poppies are painted with nasturtium red for the local tone, which may be shaded with blood red for the dark tones and violet in the deepest shadows. The centers are painted with brown green, violet and touches of black over violet.

The leaves are yellow green, dark green, brown green and dark green No. 7 and violet for the shadows. For a background copenhagen grey, egg yellow, dark green, violet, yellow green, ivory yellow and pearl grey are colors that may be used with good effect.

Primrose The pink blossoms are painted with crimson washed in thinly Primrose for the first fire. Retouch with crimson and for the deep shadows a little ruby purple. The centers are a touch of egg yellow and a little brown green. The leaves are yellow green for the first fire. Retouch with brown green, grey green and moss green. Background of copenhagen grey modified with yellow brown, brown pink and a slight powdering of crimson as a reflection from the blossoms.

Red Roses Use ruby purple for the local tone. The darker portions Red Roses are to be retouched with ruby. For the deepest shadows use a very little black. Pansy purple is useful for the centers. Before the last firing, dry thoroughly and powder very slightly with pompadour red.

Rose Leaves Apple green, rose leaf green and royal dark green are used for the local tone. For retouching and strengthening use russian green, brown green and dark green No. 7. Brown green is useful for stems and it should be partially overlaid with violet of iron. Warm tones in the leaves are produced with yellow brown and deep red brown, also violet of iron.

Strawberries The colors are yellow red and pompadour and the seeds Strawberries are made with touches of chestnut brown. Unripe berries are painted with mixing yellow and yellow green shaded into pompadour red. Berries in the background and shown indistinctly may be painted with copenhagen grey and tinted with yellow and a little pompadour red. The leaves are painted with olive green, dark green, meis sen brown and touches of pompadour red. One can use a background of brown tones such as egg yellow shaded into chestnut brown and darkened with deep red brown in the darkest tones.

Sweet Peas The pink blossoms are painted with best pink, washing out Sweet Peas and leaving the white china for the highlights. The deepest shadows are crimson. Yellow blossoms are painted with ivory yellow, the darker portions being canary yellow and touches of yellow red for the deepest shadows. Violet blossoms are painted with lilac, and shaded with royal violet. Deep red blossoms are painted with ruby purple and shaded with a little pansy purple.

Trumpet Flowers The local tone is nasturtium red, the shadows are carnation, blood red, and the deepest shadows a little deep red brown. A little egg yellow may be worked into the highlights. The treatment for leaves is same as for rose leaves excepting that the stems are not overlaid with violet of iron.

Violets (Single or Double) The local tone for light violets is lilac and Violets (Single or Double) for dark violets, violet. Pansy purple may be used for the deepest shadows and centers, a touch of egg yellow and

pompadour red is also used in the centers. The leaves are grass green, brown green and dark green No. 7. In the background use coalport green, egg yellow and a little ruby purple, and a little nasturtium red over the yellows will add warmth.

Yellow Roses The local tone is lemon yellow, which may be graduated to a thin wash for the highlights. The darker portions may be retouched with silver yellow and in the deepest shadows yellow brown and a touch of nasturtium red. A touch of brown green is used in the centers.

GENERAL SUGGESTIONS

When possible, relief enamels should be reserved for the last firing, as repeated firings may cause them to scale.

Pinks or rubies, when underfired, are apt to appear yellowish or brownish in tone. If overfired they take on a bluish or violet tinge.

Colors that are underfired are without glaze, have a dirty appearance and sometimes can be rubbed off.

China that has been in use will not fire successfully, because it is liable to fire with black spots showing under the glaze, often ruining the article.

The proportion of painting oil to powder colors is about equal parts. It should be mixed to form a soft creamy-like mass, thin enough so that it will flow from the brush readily, and just thick enough so that when placed on the palette it will not spread rapidly.

Oil of cloves is a slow drying oil and is often used to keep colors open a long time, especially when painting large pieces, a little is added to the mixed paint. But china that has been painted with it must be thoroughly dried in an oven before sending to be fired, otherwise the colors may run in firing.

Some painting mediums cause the colors to dry out glossy on the china before firing. Such oils gather dust and may cause the paint to blister in firing.

Peaches, plums, grapes and other fruits exhibit a bloom on the surface that is often very difficult to reproduce in a painting, but it is best shown by a very thin line of copenhagen grey on the upper edge of the fruit. Some artists use a thin line of matt warm grey. It is more apt to give the fuzzy appearance of the natural bloom.

A useful dropper for oils is to place a toothpick in the bottom of the cork of the oil bottle. On removing the cork from the bottle the toothpick will carry a little of the oil, which is convenient when only a drop of oil is wanted.

In brushes, experienced china painters advise the use of large ones, as it enables one to work quicker and easier as soon as they get accustomed to them. Small brushes get one in the habit of working in a mincing manner and quite impossible to get broad, bold strokes or even tints.

Brushes with comparatively long handles are an advantage and when working with them hold them as far away from the points as possible, which will give you freedom of touch and ease in working, and will add speed and character to your work. It does away with that crampy effect.

A brush properly cared for will last a long time and it pays to buy the very best. They cost a trifle more, but they do better work and wear better than the cheaper brushes.

Firing In the matter of kilns there are no advantages in an expensive kiln over a cheaper one. For instance, a \$15 charcoal kiln will do just as good firing as a \$125 oil kiln. It will not hold as much china, but in getting right down to results, one is just as good as the other, and the charcoal kiln often outwears the oil kiln. Nevertheless oil kilns are good and do excellent work and are very convenient for studio use, whereas the charcoal kiln cannot be used in the studio.

Before firing china it is well to see that it is dry and free from dust. Any particles can be removed with a dust needle. When oil of cloves or other slow drying oil has been used in painting, it is advisable to dry the china in an oven before firing. If a brown discoloration shows from oven drying, it will disappear in the firing.

Often the back of the china is full of finger marks which may fire in unless removed. All ink and color marks on the back of the china should be removed, leaving the china clean for firing.

When painted china has been packed in cotton before firing, simply remove all the cotton possible by gently rubbing it off. The little lint that remains will burn away and not show after firing.

China that has been tinted by the dusting method should be carefully dusted off with a camels hair brush so as to remove all excess of color.

If a kiln has stood for some time, or if the weather has been damp, it is best to warm the kiln so as to dry it out thoroughly before placing the china in it for firing. A damp kiln will prevent the colors from glazing well.

Place the largest china at the bottom of the kiln; separate the articles by means of stilts. The stilt can touch the decoration provided the color is not painted on heavily. The point of a stilt will stick to heavy color, making a bad place in the china, but does no harm over light tinting.

Plates may be laid one over the other if separated with stilts. The best method is to use three smallest size stilts between each plate. A high stack of plates will then have no tendency to tip over, as it sometimes happens when only one stilt is placed between. Asbestos twine can be used instead of stilts provided the painting or tinting is on thinly where the twine is laid, although it is best if laid on the white china with no painting under the twine.

Plates may also be set on edge. Cups, saucers and other small articles may be placed in the kiln promiscuously, upside down, on edge, or any way most convenient, but it is necessary to separate the articles with stilts so that the china articles do not touch each other, and it is also necessary not to wedge them in any manner, because china expands in heating and ample allowance must be provided for expansion and contraction, otherwise the china will break in firing.

Tile should always stand on edge. It and belleek ware should always be carefully fired. The firing should start slowly at first and the

kiln should be cooled after firng as slowly as possible, as too rapid heating or cooling will cause the glaze to crackle or craze.

If the kiln has shelves, stack until nearly the height of the first shelf, then begin stacking china on the shelf, beginning about the same as in the bottom of the firing pot.

When the kiln is stacked it must be closed ready for firing. Most charcoal and gas kilns have a pipe at the lower part of the firing pot to admit air and in the cover a peep hole, so that when the kiln gets hot a circulation of air passes through the firing pot, allowing all smoke and gases to pass away, but oil kilns have no provision like this, but instead it is customary to close the door partly, leaving it slightly ajar so that the smoke from the oils can escape, and as soon as the smoke is driven off, then the door is tightly closed and must not be again opened until the kiln has been fired and thoroughly cooled down. The slower it is cooled the better, as that anneals the china and will render it less susceptible to chipping or breaking in handling.

The firing with different fuels is approximately the same. In all cases start the fire low so that the kiln will heat up slowly. When the firing chamber gets red hot the fire may be increased and allowed to heat until the desired temperature has been reached. From 700 to 850 degrees centigrade is the proper heat, and it may be readily determined by using firing tests, placing one on an old bit of china and in the kiln where it can be seen from the peep hole. When the test melts down flat it indicates the proper temperature and the firing is then sufficient. The kiln must stand until thoroughly cooled down. Over night is best. Close all drafts and dampers so as to facilitate slow cooling.

Raised paste and enamels should be thoroughly dried before placing in the kiln. Any paint or enamel that looks bright and oily is liable to blister in firing. Drying it out in an oven until it looks dull may prevent blistering in firing.

Underfired gold is dark and unsatisfactory in color, but sometimes gold comes out dark and will not burnish. It is because the brush for laying it was not clean. Gold applied too thinly will rub off after firing.

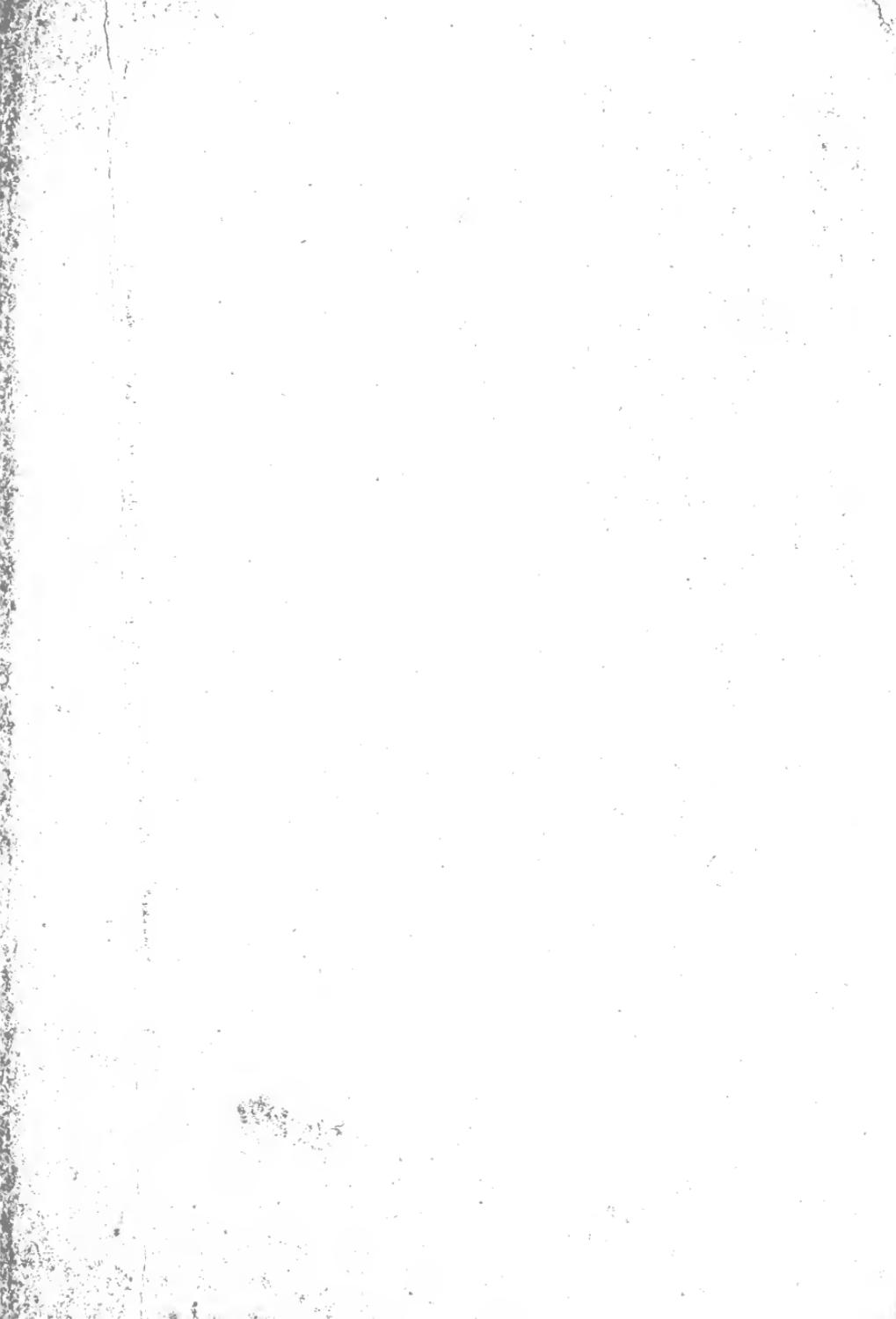
Sometimes china will break in firing. This is usually caused by too rapid heating of the kiln or too rapid cooling. Overcrowding the kiln is also a cause. Some colors, if applied very heavily, may scale after firing. This is caused by too hard a fire and too rapid cooling, and sometimes happens if the china is taken from the kiln while it is still warm. China is not annealed until it gets perfectly cool. If you take a piece of decorated china from the kiln while warm and hold it near your ear, you can often hear it crackling and crazing and if the color is on heavily you can hear it loosen from the china. It may not chip off right away, but it becomes loosened and will scale off sooner or later.

To maintain a high temperature in a kiln for any length of time is unnecessary and may spoil the glaze, because colors contain volatile fluxes which gradually evaporate at a high heat and after a time would leave only the infusible portions of the colors and would result in a matt color. Matt colors are the same as the regular glaze colors, excepting that they do not contain enough lead and alkali to make them glaze.

Therefore it is a mistake to try to fire by any certain length of time,

as the draft, atmospheric conditions and fuel feed may vary from one time to another. The correct way is to heat the kiln until the colors melt, and when that point is reached, discontinue the fuel and allow the kiln to cool down as slowly as possible.

An experienced firer can tell by the appearance of the paint on the china when it has melted, because it looks brighter than the rest of the china. It seems to be hotter and sometimes has a glistening or wet appearance that indicates that the color has melted and formed a glaze that reflects the heat better than the china.



1. *Chlorophytum comosum*

2. *Chlorophytum comosum*

3. *Chlorophytum comosum*